SIRIS:

A CHAIN OF Philoſophical Reflexions AND INQUIRIES Concerning the VIRTUES of *TAR WATER*,

And divers other *Subjects* connected together
and ariſing one from another.

By *G. L. B. O. C.* K

As we have opportunity let us do good unto all men.
GAL. vi. 10.

Hoc opus hoc ſtudium parvi properemus et ampli.
HOR.

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SIRIS:

A CHAIN OF Philoſophical Reflexions AND INQUIRIES, &c.

FOR INTRODUCTION to the following piece I aſſure the reader, that nothing could, in my preſent ſituation, have induced me to be at the pains of writing it, but a firm belief that it would prove a valuable preſent to the Public. What entertainment ſoever the reaſoning or notional part may afford the mind, I will venture to ſay, the other part ſeemeth ſo ſurely calculated to do good to the Body, that both muſt be gainers. For if the lute be not well tuned, the muſician fails of his harmony. And in our preſent ſtate, the operations of the mind, ſo far depend on the right tone or good condition of it's inſtrument, that any thing which greatly contributes to preſerve or recover the health of the body, is well worth the attention of the mind. Theſe conſiderations have moved me to communicate to the Public the ſalutary virtues of Tar water; to which I thought my ſelf indiſpenſibly obliged, by the duty every man owes to mankind. And, as effects are linked with their cauſes, my thoughts on this low but uſeful theme led to farther inquiries, and thoſe on to others remote, perhaps, and ſpeculative but, I hope, not altogether uſeleſs or unentertaining.

1. IN certain parts of America, Tar water is made by putting a quart of cold water to a quart of tar, and ſtirring them well together in a veſſel, which is left ſtanding till the tar ſinks to the bottom. A glaſs of clear water being poured off for a draught is replaced by the ſame quantity of freſh water, the veſſel being ſhaken and left to ſtand as before. And this is repeated for every glaſs; ſo long as the tar continues to impregnate the water

ſufficiently, which will appear by the ſmell and taſte. But as this method produceth tar water of different degrees of ſtrength, I chuſe to make it in the following manner. Pour a gallon of cold water on a quart of tar, and ſtir and mix them thoroughly with a ladle or flat ſtick far the ſpace of three or four minutes, after which the veſſel muſt ſtand eight and forty hours that the tar may have time to ſubſide, when the clear water is to be poured off and kept for uſe, no more being made from the ſame tar, which may ſtill ſerve for common purpoſes.

2. THIS cold infuſion of tar hath been uſed in ſome of our colonies, as a preſervative or preparative againſt the ſmall-pox, which foreign practice induced me to try it in my own neighbourhood, when the ſmall-pox raged with great violence. And the tryal fully anſwered my expectation: all thoſe, within my knowledge, who took the tar water having either eſcaped that diſtemper, or had it very favourably. In one family there was a remarkable inſtance of ſeven children, who came all very well through the ſmall pox, except one young child which cou'd not be brought to drink tar water as the reſt had done.

III. SEVERAL

3. Several were preſerved from taking the ſmall pox by the uſe of this liquor: others had it in the mildeſt manner, and others that they might be able to take the infection were obliged to intermit drinking the tar-water. I have found it may be drunk with great ſafety and ſucceſs for any length of time, and this not only before, but alſo during the diſtemper. The general rule for taking it is, about half a pint night and morning on an empty ſtomach, which quantity may be varied, according to the caſe and age of the patient, provided it be always taken on an empty ſtomach, and about two hours before or after a meal.

4. It ſeemed probable, that a medicine of ſuch efficacy in a diſtemper attended with ſo many purulent ulcers, might be alſo uſeful in other foulneſſes of the blood, accordingly I tried it on ſeveral perſons infected with cutaneous eruptions and ulcers, who were ſoon relieved, and ſoon after cured. Encouraged by theſe Succeſſes I ventured to adviſe it in the fouleſt diſtempers, wherein it proved much more ſucceſsful than Salivations and wood drinks had done.

5. Having tried it in a great variety of caſes, I found it ſucceed beyond my hopes; in a tedious and painful ulceration of the bowels, in a conſumptive cough and (as appeared by expectorated pus) an ulcer in the lungs; in a pleuriſy and peripneumony. And when a perſon, who for ſome years had been ſubject to eryſipelatous fevers, perceived the uſual fore-running ſymptoms to come on, I adviſed her to drink tar water which prevented the eryſipelas.

6. I never knew any thing ſo good for the ſtomach as tar water: it cures indigeſtion and gives a good appetite. It is an excellent medicine in an aſthma. It imparts a kindly warmth and quick circulation to the juices without heating, and is therefore uſeful, not only as a pectoral and balſamic, but alſo as a powerful and ſafe deobſtruent in cachectic and hyſteric caſes. As it is both healing and diuretic, it is very good for the gravel. I believe it to be of great uſe in a dropſy, having known it cure a very bad anaſarca in a perſon whoſe thirſt, though very extraordinary, was in a ſhort time removed by the drinking of tar water.

7. The uſefulneſs of this medicine in inflammatory caſes is evident, from what has been already obſerved (*a*). And yet ſome perhaps may ſuſpect that, as the tar it ſelf is ſulphureous, tar water muſt be of a hot and inflaming nature. But it is to be noted that all balſams contain an acid ſpirit, which is in truth a volatile ſalt. Water is a menſtruum that diſſolves all ſorts of ſalts, and draws them from their ſubjects. Tar, therefore, being a balſam, it's ſalutary acid is extracted by water, which yet is incapable of diſſolving it's groſs reſinous parts, whoſe proper menſtruum is ſpirit of wine. Therefore tar water, not being impregnated with reſin, may be ſafely uſed in inflammatory caſes: and in fact it hath been found an admirable febrifuge, at once the ſafeſt cooler and cordial.

8. The volatile ſalts ſeparated by infuſion from tar, may be ſuppoſed to contain it's ſpecific vertues. Mr. Boyle and other later Chymiſts are agreed, that fixed ſalts are much the ſame in all bodies. But it is well known that volatile ſalts do greatly differ, and the eaſier they are ſeparated from the ſubject,

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(*a*). *Sect.* 5.

ſubject, the more do they poſſeſs of its ſpecific qualities. Now the moſt eaſy ſeparation is by infuſion of tar in cold water, which to ſmell and taſte ſhewing it ſelf well impregnated, may be preſumed to extract and retain the moſt pure volatile and active particles of that vegetable balſam.

9. TAR was by the ancients eſteemed good againſt poiſons, ulcers, the bites of venomous creatures, alſo for pthiſical, ſcrophulous, paralitic and aſthmatic perſons. But the method of rendering it an inoffenſive medicine and agreeable to the ſtomach, by extracting it's virtues in cold water, was unknown to them. The leaves and tender tops of pine and fir are in our times uſed for diet drinks, and allowed to be antiſcorbutic and diuretic. But the moſt elaborate juice, ſalt, and ſpirit of thoſe evergreens are to be found in tar; whoſe virtues extend not to animals alone, but alſo to vegetables. Mr. Evelyn in his treatiſe on Foreſt trees obſerves with wonder, that ſtems of trees, ſmeared over with tar, are preſerved thereby from being hurt by the invenomed teeth of goats and other injuries, while every other thing of an unctuous nature is highly prejudicial to them.

10. It ſeems that tar and turpentine may be had more or leſs, from all ſorts of pines and firs whatſoever; and that the native ſpirits and eſſential ſalts of thoſe vegetables are the ſame in turpentine and common tar. In effect this vulgar tar, which cheapneſs and plenty may have rendered contemptible, appears to be an excellent balſam, containing the virtues of moſt other balſams, which it eaſily imparts to water, and by that means readily and inoffenſively inſinuates them into the habit of the body.

11. The reſinous exſudations of pines and firs are an important branch of the materia medica, and not only uſeful in the preſcriptions of phyſicians, but have been alſo thought otherwiſe conducive to health. Pliny tells us, that wines in the time of the old Romans were medicated with pitch and reſin; and Jonſtonus in his Dendrographia obſerves that it is wholeſome to walk in groves of pine trees, which impregnate the air with balſamic particles. That all turpentines and reſins are good for the lungs, againſt gravel alſo and obſtructions, is no ſecret. And that the medicinal properties of thoſe drugs are found in Tar water, without heating the

blood, or diſordering the ſtomach, is confirmed by experience: and particularly that pthiſical and aſthmatic perſons receive ſpeedy and great relief from the uſe of it.

12. **Balsams**, as all unctuous and oily medicines, create a nauſeating in the ſtomach. They cannot therefore be taken in ſubſtance, ſo much or ſo long, as to produce all thoſe ſalutary effects, which, if thoroughly mixed with the blood and juices, they wou'd be capable of producing. It muſt therefore be a thing of great benefit, to be able to introduce any requiſite quantity of their volatile parts into the fineſt ducts and capillaries, ſo as not to offend the ſtomach, but, on the contrary, to comfort and ſtrengthen it in a great degree.

13. **According** to Pliny, liquid pitch (as he calls it) or Tar was obtained by ſetting fire to billets of old fat pines or firs. The firſt running was tar, the later or thicker running was pitch. Theophraſtus is more particular: he tells us the Macedonians made huge heaps of the cloven trunks of thoſe trees, wherein the billets were placed erect beſide each other. That ſuch heaps or piles of wood were ſometimes a hundred and eighty cubits round, and ſixty or even a

hundred high: and that having covered them with ſods of earth to prevent the flame from burſting forth (in which caſe the tar was loſt) they ſet on fire thoſe huge heaps of pine or fir, letting the tar and pitch run out in a channel.

14. Pliny ſaith, it was cuſtomary for the antients, to hold fleeces of wooll over the ſteam of boiling tar, and ſqueeze the moiſture from them, which watery ſubſtance was called piſſinum. Ray will have this to be the ſame with the piſſelæum of the ancients; but Harduin in his Notes on Pliny, thinks the piſſelæum to have been produced from the cones of cedars. What uſe they made of theſe liquors anciently I know not: But it may be preſumed they were uſed in medicine, though at preſent, for ought I can find, they are not uſed at all.

15. From the manner of procuring tar (*b*) it plainly appears to be a natural production, lodged in the veſſels of the tree, whence it is only freed and let looſe (not made) by burning. If we may believe Pliny, the firſt running or tar was called cedrium, and was of ſuch efficacy to preſerve from putrefaction, that in Ægypt they embalmed dead bodies with it. And to this he aſcribes

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(*b*) *Sect.* 13.

aſcribes their mummies continuing uncorrupted for ſo many ages.

16. Some modern writers inform us that tar flows from the trunks of pines and firs, when they are very old, through inciſions made in the bark near the root. Pitch is tar inſpiſſated: and both are the oyl of the tree grown thick and black with age and ſun. The trees like old men being unable to perſpire, and their ſecretory ducts obſtructed, they are, as one may ſay, choaked and ſtuffed with their own juice.

17. The method uſed by our colonies in America, for making tar and pitch, is in effect the ſame with that of the ancient Macedonians; as appears from the account given in the philoſophical tranſactions. And the relation of Leo Africanus who deſcribes, as an eye witneſs, the making of tar on Mount Atlas, agrees in ſubſtance, with the methods uſed by the Macedonians of old, and the people of New England at this day.

18. Jonstonus in his Dendrographia, is of opinion, that pitch was anciently made of cedar, as well as of the pine and fir grown old and oily. It ſhould ſeem indeed that

one and the ſame word was uſed by the ancients in a large ſenſe, ſo as to comprehend the juices iſſuing from all thoſe trees. Tar and all ſorts of exſudations from evergreens are, in a general acceptation, included under the name reſin. Hard coarſe reſin or dry pitch is made from tar, by letting it blaze till the moiſture is ſpent. Liquid reſin is properly an oily viſcid juice oozing from the bark of evergreen trees, either ſpontaneouſly or by inciſion. It is thought to be the oyl of the bark inſpiſſated by the ſun. As it iſſues from the tree it is liquid, but becomes dry and hard being condenſed by the ſun or by fire.

19. According to Theophraſtus, reſin was obtained by ſtriping off the bark from pines, and by inciſions made in the ſilver fir and the pitch pine. The inhabitants of Mount Ida, he tells us, ſtriped the trunk of the pine on the ſunny ſide two or three cubits from the ground. He obſerves that a good pine might be made to yield reſin every year; an indifferent every other year, and the weaker trees once in three years; and that three runnings were as much as a tree cou'd bear. It is remarked by the ſame author, that a pine doth not at once produce fruit and reſin, but the former only in its youth, the later in its old age.

20. TURPENTINE is a fine reſin. Four kinds of this are in uſe. The turpentine of Chios or Cyprus which flows from the Turpentine tree; the Venice turpentine which is got by piercing the Larch tree; the Strarsburgh Turpentine which Mr. Ray informs us is procured from the knots of the ſilver fir; it is fragrant and grows yellow with age; the fourth kind is common turpentine neither tranſparent, nor ſo liquid as the former; and this Mr. Ray taketh to flow from the mountain pine. All theſe turpentines are uſeful in the ſame intentions. Theophraſtus ſaith the beſt reſin or turpentine is got from the Terebinthus growing in Syria and ſome of the Greek iſlands. The next beſt from the ſilver fir and pitch pine.

21. TURPENTINE is on all hands allowed to have great medicinal virtues. Tar and it's infuſion contain thoſe virtues. Tar water is extremely pectoral and reſtorative, and if I may judge, from what experience I have had, it poſſeſſeth the moſt valuable qualities aſcribed to the ſeveral balſams of Peru, of Tolu, of Capivi and even to the balm of Gilead, ſuch is it's virtue in aſthmas and pleuriſies, in obſtructions and ulcerous eroſi-

ons of the inward parts. Balſams as hath been already obſerved are apt to offend the ſtomach. But tar water may be taken without offending the ſtomach. For the ſtrengthening whereof it is the beſt medicine I have ever tried.

22. THE folly of man rateth things by their ſcarceneſs, but Providence hath made the moſt uſeful things moſt common. Among thoſe liquid oily extracts from trees and ſhrubs, which are termed Balſams, and valued for medicinal virtues, Tar may hold it's place as a moſt valuable balſam. It's fragrancy ſheweth, that it is poſſeſſed of active qualities, and it's oilyneſs, that it is fitted to retain them. This excellent balſam may be purchaſed for a penny a pound, whereas the balſam of Judæa, when moſt plenty, was ſold on the very ſpot that produced it, for double its weight in ſilver, if we may credit Pliny; who alſo informs us that the beſt balſam of Judæa flowed only from the bark, and that it was adulterated with reſin and oyle of turpentine. Now comparing the vertues I have experienced in Tar, with thoſe I find aſcribed to the precious balm of Judæa, of Gilead, or of Mecha (as it is diverſly called) I am of opinion, that

the later is not a medicine of more value or efficacy than the former.

23. Pliny ſuppoſed amber to be a reſin, and to diſtill from ſome ſpecies of pine, which he gathered from it's ſmell. Nevertheleſs it's being dug out of the earth ſhews it to be a foſſil, though of a very different kind from other foſſils. But thus much is certain, that the medicinal virtues of amber are to be found in the balſamic juices of pines and firs. Particularly the virtues of the moſt valuable preparation, I mean ſalt of amber, are in a great degree anſwered by Tar water, as a detergent, diaphoretic, and diuretic.

24. There is, as hath been already obſerved, more or leſs oyl and balſam in all evergreen trees, which retains the acid ſpirit, that principle of life and verdure; the not retaining whereof in ſufficient quantity, cauſeth other plants to droop and wither. Of theſe evergreen trees productive of reſin, pitch, and tar, Pliny enumerates ſix kinds in Europe; Jonſtonus reckons up thrice that number of the pine and fir family. And, indeed, their number, their variety, and their likeneſs makes it difficult to be exact.

25. It is remarked both by Theophraſtus and Jonſtonus, that trees growing in low and ſhady places do not yield ſo good tar, as thoſe which grow in higher and more expoſed ſituations. And Theophraſtus further obſerves, that the inhabitants of mount Ida in Aſia, who diſtinguiſh the Idæan pine from the maritime, affirm, that the tar flowing from the former is in greater plenty, as well as more fragrant than the other. Hence it ſhou'd ſeem, the pines or firs in the mountains of Scotland, might be employ'd that way, and rendered valuable; even where the timber, by it's remoteneſs from water-carriage, is of ſmall value. What we call the Scotch fir is falſly ſo called, being in truth a wild foreſt pine, and (as Mr. Ray informs us) agreeing much with the deſcription of a pine growing on mount Olympus in Phrygia, probably the only place where it is found out of theſe iſlands; in which of late years it is ſo much planted and cultivated with ſo little advantage, while the cedar of Lebanon might perhaps be raiſed, with little more trouble, and much more profit and ornament.

26. The pines, which differ from the firs in the length and diſpoſition of their leaves and hardneſs of the wood, do not in Pliny's account, yield ſo much reſin as the fir trees. Several ſpecies of both are accurately deſcribed and delineated by the naturaliſts. But they all agree ſo far as to ſeem related. Theophraſtus gives the preference to that reſin which is got from the ſilver fir and pitch tree (ἐλάτη and πίτυς) before that yielded by the pine, which yet he ſaith is in greater plenty. Pliny, on the contrary, affirms that the pine produceth the ſmalleſt quantity. It ſhou'd ſeem therefore that the interpreter of Theophraſtus might have been miſtaken, in rendering πέυκη by pinus, as well as Jonſtonus, who likewiſe takes the pine for the πεύκη of Theophraſtus. Hardouin will have the pinus of Pliny to have been by others called πέυκη, but by Theophraſtus πίτυς. Ray thinks the common fir, or picea of the Latins to be the male fir of Theophraſtus. This was probably the ſpruce fir; for the picea according to Pliny, yields much reſin, loves a cold and mountainous ſituation, and is diſtinguiſhed, tonſili facilitate, by its fitneſs to be ſhorn, which agrees with the ſpruce fir, whereof I have ſeen cloſe ſhorn hedges.

27. There ſeems to have been ſome confuſion in the naming of theſe trees, as well among the ancients as the moderns. The ancient Greek and Latin names are by later authors applied very differently. Pliny himſelf acknowledgeth, it is not eaſy even for the skilful to diſtinguiſh the trees by their leaves, and know their ſexes and kinds: and that difficulty is ſince much increaſed, by the diſcovery of many new ſpecies of that evergreen tribe, growing in various parts of the globe. But deſcriptions are not ſo eaſily miſapplied as names. Theophraſtus tells us, that πιτυς differeth from πεύκη, among other things, in that it is neither ſo tall nor ſo ſtreight, nor hath ſo large a leaf. The fir he diſtinguiſheth into male and female: the later is ſofter timber than the male, it is alſo a taller and fairer tree, and this is probably the ſilver fir.

28. To ſay no more on this obſcure buſineſs which I leave to the Criticks, I ſhall obſerve that according to Theophraſtus not only the turpentine trees, the pines, and the firs yield reſin or tar, but alſo the cedars and palm trees; and the words pix and reſina are taken by Pliny in ſo large a ſenſe as to include the

weepings of the Lentiſcus and Cypreſs, and the balms of Arabia and Judæa; all which perhaps are near of kin, and in their moſt uſeful qualities concur with common tar, eſpecially the Norwegian, which is the moſt liquid and beſt for medicinal uſes of any that I have experienced. Thoſe trees that grow on mountains, expoſed to the ſun or the North wind, are reckoned by Theophraſtus to produce the beſt and pureſt Tar: And the Idæan pines were diſtinguiſhed from thoſe growing on the plain, as yielding a thinner, ſweeter, and better ſcented tar, all which differences I think I have obſerved, between the tar that comes from Norway, and that which comes from low and ſwampy countries.

29. Agreeably to the old obſervation of the Peripatetics, that heat gathereth homogeneous things and diſperſeth ſuch as are heterogeneous, we find chymiſtry is fitted for the analyſis of bodies. But the chymiſtry of nature is much more perfect than that of human art, inaſmuch as it joineth to the power of heat that of the moſt exquiſite mechaniſm. Thoſe who have examined the ſtructure of trees and plants by microſcopes, have diſcovered an admirable variety of fine capillary tubes and veſſels, fitted for ſeveral purpoſes,

as the imbibing or attracting of proper nouriſhment, the diſtributing thereof through all parts of the vegetable, the diſcharge of ſuperfluities, the ſecretion of particular juices. They are found to have ducts anſwering to the tracheæ in animals, for the conveying of air; they have others anſwering to lacteals, arteries and veins. They feed, digeſt, reſpire, perſpire and generate their kind, and are provided with organs nicely fitted for all thoſe uſes.

30. The ſap veſſels are obſerved to be fine tubes running up through the trunk from the root. Secretory veſſels are found in the bark, buds, leaves, and flowers. Exhaling veſſels, for carrying off excrementitious parts, are diſcovered throughout the whole ſurface of the vegetable. And (though this point be not ſo well agreed) doctor Grew in his anatomy of plants, thinks there appears a circulation of the ſap, moving downwards in the root, and feeding the trunk upwards.

31. Some difference indeed there is between learned men, concerning the proper uſe of certain parts of vegetables. But, whether the diſcoverers have rightly gueſſed at all their uſes or no, thus much is certain, that there

are innumerable fine and curious parts in a vegetable body, and a wonderful ſimilitude or analogy between the mechaniſm of plants and animals. And perhaps ſome will think it not unreaſonable, to ſuppoſe the mechaniſm of plants more curious than even that of animals, if we conſider not only the ſeveral juices ſecreted by different parts of the ſame plant, but alſo, the endleſs variety of juices drawn and formed out of the ſame ſoil, by various ſpecies of vegetables; which muſt therefore differ in an endleſs variety, as to the texture of their abſorbent veſſels and ſecretory ducts.

32. A Body, therefore, either animal or vegetable may be conſidered, as an organiſed ſyſtem of tubes and veſſels, containing ſeveral ſorts of fluids. And as fluids are moved through the veſſels of animal bodies, by the ſyſtole and diaſtole of the heart, the alternate expanſion and condenſation of the air, and the oſcillations in the membranes and tunicks of the veſſels; even ſo by means of air expanded and contracted in the tracheæ or veſſels made up of elaſtic fibres, the ſap is propelled through the arterial tubes of a plant, and the vegetable juices, as they are rarefied by heat or condenſed by cold, will either aſ-

cend and evaporate into air, or deſcend in the form of a groſs liquor.

33. JUICES therefore, firſt purified by ſtraining through the fine pores of the root, are afterwards exalted by the action of the air and veſſels of the plant, but, above all, by the action of the ſun's light; which at the ſame time that it heats, doth wonderfully rarefy and raiſe the ſap; till it perſpires and forms an atmoſphære, like the effluvia of animal bodies. And though the leaves are ſuppoſed to perform principally the office of lungs, breathing out excrementitious vapours and drawing in alimentary; yet it ſeems probable, that the reciprocal actions of repulſion and attraction, are performed all over the ſurface of vegetables, as well as animals. In which reciprocation, Hippocrates ſuppoſeth the manner of nature's acting, for the nouriſhment and health of animal bodies chiefly to conſiſt. And, indeed, what ſhare of a plant's nouriſhment is drawn through the leaves and bark, from that ambient heterogeneous fluid called air, is not eaſy to ſay. It ſeems very conſiderable and altogether neceſſary, as well to vegetable as animal life.

34. It is an opinion received by many, that the ſap circulates in plants as the blood in animals: that it aſcends through capillary arteries in the trunk, into which are inoſculated other veſſels of the bark anſwering to veins, which bring back to the root the remainder of the ſap, over and above what had been depoſited, during it's aſcent by the arterial veſſels, and ſecreted for the ſeveral uſes of the vegetable throughout all it's parts, ſtem, branches leaves, flowers, and fruit. Others deny this circulation, and affirm that the ſap doth not return through the bark veſſels. It is nevertheleſs agreed by all that there are aſcending and deſcending juices; while ſome will have the aſcent and deſcent to be a circulation of the ſame juices through different veſſels: others will have the aſcending juice to be one ſort attracted by the root, and the deſcending another imbibed by the leaves, or extremities of the branches; laſtly, others think that the ſame juice, as it is rarefied or condenſed by heat or cold, riſes and ſubſides in the ſame tube. I ſhall not take upon me to decide this controverſy. Only I cannot help obſerving, that the vulgar argument from analogy between plants and animals loſeth much of it's force, if it be conſidered, that

the ſuppoſed circulating of the ſap, from the root or lacteals through the arteries, and thence returning, by inoſculations, through the veins or bark veſſels to the root or lacteals again, is in no ſort conformable or analogous to the circulation of the blood.

35. It is ſufficient to obſerve, what all muſt acknowledge, that a plant or tree is a very nice and complicated machine (*g*); by the ſeveral parts and motions whereof, the crude juices admitted through the abſorbent veſſels, whether of the root, trunk, or branches, are variouſly mixed, ſeparated, altered, digeſted, and exalted in a very wonderful manner. The juice as it paſſeth in and out, up and down, through tubes of different textures, ſhapes, and ſizes, and is affected by the alternate compreſſion and expanſion of elaſtic veſſels, by the viciſſitudes of ſeaſons, the changes of weather, and the various action of the ſolar light, grows ſtill more and more elaborate.

36. There is therefore no chymiſtry like that of nature, which addeth to the force of fire the moſt delicate, various and artificial percolation (*d*). The inceſſant action of the ſun

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(*g*) 30, 31 (*d*) 29.

ſun upon the elements of air, earth, and water, and on all ſorts of mixed bodies, animal, vegetable and foſſil, is ſuppoſed to perform all ſorts of chymical operations. Whence it ſhould follow, that the air contains all ſorts of chymic productions, the vapours, fumes, oyls, ſalts, and ſpirits of all the bodies we know: From which general aggregate or maſs, thoſe that are proper being drawn in, through the fine veſſels of the leaves, branches, and ſtem of the tree, undergo in it's various organs, new alterations, ſecretions, and digeſtions, till ſuch time as they aſſume the moſt elaborate form.

37. Nor is it to be wondered, that the peculiar texture of each plant or tree, cooperating with the ſolar fire and preexiſting juices, ſhould ſo alter the fine nouriſhment drawn from earth and air, (*f*) as to produce various ſpecific qualities of great efficacy in medicine; eſpecially if it be conſidered that in the opinion of learned men, there is an influence on plants derived from the ſun, beſides it's mere heat. Certainly doctor Grew, that curious anatomiſt of plants, holds the ſolar influence to differ from that of a mere culinary

fire,

(*f*) 33.

fire, otherwiſe than by being only a more temperate and equal heat.

38. THE alimentary juice taken into the lacteals, whether of animals or vegetables, conſiſts of oily, aqueous, and ſaline particles, which being diſſolved, volatiliſed, and diverſly agitated, part thereof is ſpent and exhaled into rhe air; and that part which remains is by the œconomy of the plant, and action of the ſun, ſtrained, purified, concocted, and ripened into an inſpiſſated oyl or balſam, and depoſited in certain cells placed chiefly in the bark, which is thought to anſwer the panniculus adipoſus in animals, defending trees from the weather, and, when in ſufficient quantity, rendering them evergreen. This balſam, weeping or ſweating through the bark, hardens into reſin; aud this moſt copiouſly in the ſeveral ſpecies of pines and firs, whoſe oyl being in greater quantity, and more tenacious of the acid ſpirit or vegetable ſoul (as perhaps it may not improperly be called) abides the action of the ſun, and attracting the ſun beams, is thereby exalted and enriched, ſo as to become a moſt noble medicine; ſuch is the laſt product of a tree, perfectly maturated by time and ſun.

39. It is remarked by Theophraſtus, that all plants and trees while they put forth have moſt humour, but when they have ceaſed to germinate and bear, then the humour is ſtrongeſt and moſt ſheweth the nature of the plant, and that, therefore, trees yielding reſin ſhould be cut after germination. It ſeems alſo very reaſonable to ſuppoſe the juice of old trees, whoſe organs bring no new ſap, ſhould be better ripened than that of others.

40. The aromatic flavours of vegetables ſeem to depend upon the ſun's light, as much as colours. As in the production of the later, the reflecting powers of the object, ſo in that of the former, the attractive and organical powers of the plant cooperate with the ſun (*b*). And as from ſir Iſaac Newton's experiments it appears, that all colours are virtually in the white light of the ſun, and ſhew themſelves when the raies are ſeparated by the attracting and repelling powers of objects, even ſo the ſpecific qualities of the elaborate juices of plants ſeem to be virtually or eminently contained in the ſolar light, and are actually exhibited upon the ſeparation of the raies, by the peculiar powers of

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(*b*) 36, 37.

of the capillary organs in vegetables, attracting and imbibing certain raies, which produce certain flavours and qualities, in like manner as certain raies being reflected, produce certain colours.

41. It hath been obſerved by ſome curious anatomiſts, that the ſecretory veſſels in the glands of animal bodies are lined with a fine down, which in different glands is of different colours. And it is thought, that each particular down, being originally imbued with it's own proper juice, attracts none but that ſort; by which means ſo many various juices are ſecreted in different parts of the body. And perhaps there may be ſomething analogous to this, in the fine abſorbent veſſels of plants, which may cooperate towards producing that endleſs variety of juices, elaborated in plants from the ſame earth and air.

42. The balſam or eſſential oyl of vegetables contains a ſpirit, wherein conſiſt the ſpecific qualities, the ſmell and taſte of the plant. Boerhaave holds the native preſiding ſpirit to be neither, oyl, ſalt, earth, or water; but ſomewhat too fine and ſubtile to be caught alone and rendered viſible to the eye. This when

ſuffered to fly off, for inſtance, from the oyl of roſemary, leaves it deſtitute of all flavour This ſpark of life, this ſpirit or ſoul, if we may ſo ſay, of the vegetable departs without any ſenſible diminution of the oyl or water wherein it was lodged.

43. It ſhould ſeem that the forms, ſouls, or principles of vegetable life, ſubſiſt in the light or ſolar emanation (*m*), which in reſpect of the macrocoſm is what the animal ſpirit is to the microcoſm; the interior tegument, the ſubtile inſtrument and vehicle of power. No wonder then that the ens primum or ſcintilla ſpirituoſa, as it is called, of plants ſhould be a thing ſo fine and fugacious as to eſcape our niceſt ſearch. It is evident that nature at the ſun's approach vegetates; and languiſhes at his receſs; this terreſtrial globe ſeeming only a matrix diſpoſed and prepared to receive life from his light; whence Homer in his hymns ſtyleth earth the wife of heaven, ἄλοχ, ὀυρανοῦ ἀστερόεντος.

44. The luminous ſpirit which is the form or life of a plant, from whence it's differences and properties flow, is ſomewhat extremely volatile,

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(*m*) 40.

volatile. It is not the oyl, but a thing more ſubtile whereof oyl is the vehicle, which retains it from flying off, and is lodged in ſeveral parts of the plant, particularly in the cells of the bark and in the ſeeds. This oyl purified and exalted by the organical powers of the plant, and agitated by warmth, becomes a proper receptacle of the ſpirit; part of which ſpirit exhales through the leaves and flowers, and part is arreſted by this unctuous humour that detains it in the plant. It is to be noted this eſſential oyl animated, as one may ſay, with the flavour of the plant is very different from any ſpirit, that can be procured from the ſame plant by fermentation.

45. Light impregnates air, (*n*) air impregnates vapour; and this becomes a watery juice by deſtillation having riſen firſt in the cold ſtill with a kindly gentle heat. This fragrant vegetable water is poſſeſſed of the ſpecific odour and taſte of the plant. It is remarked that deſtilled oyls added to water for counterfeiting the vegetable water can never equal it, artificial chymiſtry falling ſhort of the natural.

46. The

(*n*) 37. 43.

46. THE leſs violence is uſed to nature the better it's produce. The juice of olives or grapes iſſuing by the lighteſt preſſure is beſt. Reſins that drop from the branches ſpontaneouſly, or ooze upon the ſlighteſt inciſion, are the fineſt and moſt fragrant. And infuſions are obſerved to act more ſtrongly than decoctions of plants, the more ſubtile and volatile ſalts and ſpirits, which might be loſt or corrupted by the later, being obtained in their natural ſtate by the former. It is alſo obſerved that the fineſt, pureſt, and moſt volatile part is that which firſt aſcends in deſtillation. And, indeed, it ſhould ſeem the lighteſt and moſt active particles required leaſt force to diſengage them from the ſubject.

47. THE ſalts, therefore, and more active ſpirits of the tar are got by infuſion in cold water: but the reſinous part is not to be diſſolved thereby: (*p*) Hence the prejudice which ſome perhaps may entertain againſt Tar water, as a medicine, the uſe whereof might inflame the blood by it's ſulphur and reſin, appears to be not well grounded; it being indeed impregnated with a fine acid ſpirit,

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(*p*) *Sect.* 7.

ſpirit, balſamic, cooling, diuretic, and poſſeſſed of many other virtues (*q*). Spirits are ſuppoſed to conſiſt of ſalts and phlegme, probably too ſomewhat of a fine oily nature, differing from oyl in that it mixeth with water, and agreeing with oyl, in that it runneth in rivulets by deſtillation. Thus much is allowed, that the water, earth, and fixed ſalt are the ſame in all plants; that, therefore, which differenceth a plant or makes it what it is, the native ſpark or form, in the language of the chymiſts or ſchools, is none of thoſe things, nor yet the fineſt oyl, which ſeemeth only it's receptacle or vehicle. It is obſerved by chymiſts, that all ſorts of balſamic wood afford an acid ſpirit, which is the volatile oily ſalt of the vegetable: Herein is chiefly contained their medicinal virtues, and by the tryals I have made it appears, that the acid ſpirit in tar water, poſſeſſeth the virtues, in an eminent degree, of that of guaiacum, and other medicinal woods.

48. Qualities in a degree too ſtrong for human nature to ſubdue, and aſſimilate to it ſelf, muſt hurt the conſtitution. All acids, therefore, may not be uſeful or innocent. But this ſeemeth an acid ſo thoroughly concocted, ſo

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(*q*) *Sect.* 42, 44.

ſo gentle, bland, and temperate, and withal a ſpirit ſo fine and volatile, as readily to enter the ſmalleſt veſſels, and be aſſimilated with the the utmoſt eaſe.

49. If any one were minded to diſſolve ſome of the reſin, together with the ſalt or ſpirit, he need only mix ſome ſpirit of wine with the water. But ſuch an intire ſolution of reſins and gums, as to qualify them for entering and pervading the animal ſyſtem, like the fine acid ſpirit that firſt flies off from the ſubject, is perhaps impoſſible to obtain. It is an apothegme of the chymiſts, derived from Helmont, that whoever can make myrrh ſoluble by the human body, has the ſecret of prolonging his days: and Boerhaave owns that there ſeems to be truth in this, from it's reſiſting putrefaction. Now this quality is as remarkable in Tar, with which the ancients embalmed and preſerved dead bodies, And though Boerhaave himſelf, and other chymiſts before him, have given methods for making ſolutions of myrrh, yet it is by means of alcohol which extracts only the inflammable parts. And it doth not ſeem that any ſolution of myrrh is impregnated with it's ſalt or acid ſpirit. It may

not, therefore, ſeem ſtrange if this water ſhou'd be found more beneficial for procuring health and long life, than any ſolution of myrrh whatſoever.

50. CERTAINLY divers reſins and gums may have virtues, and yet not be able for their groſſneſs to paſs the lacteals and other finer veſſels, nor yet, perhaps, readily impart thoſe virtues to a menſtruum, that may with ſafety and ſpeed convey them throughout the human body. Upon all which accounts, I believe tar water will be found to have ſingular advangages. It is obſerved that acid ſpirits prove the ſtronger, by how much the greater degree of heat is required to raiſe them. And indeed, there ſeemeth to be no acid more gentle than this, obtained by the ſimple affuſion of cold water; which carries off from the ſubject the moſt light and ſubtile parts, and, if one may ſo ſpeak, the very flower of it's ſpecific qualities. And here it is to be noted, that the volatile ſalt and ſpirit of vegetables do, by gently ſtimulating the ſolids, attenuate the fluids contained in them, and promote ſecretions, and that they are penetrating and active, contrary to the general nature of other acids.

51. It is a great maxim for health, that the juices of the body be kept fluid in a due proportion. Therefore, the acid volatile ſpirit in tar water, at once attenuating and cooling in a moderate degree, muſt greatly conduce to health, as a mild ſalutary deobſtruent, quickening the circulation of the fluids without wounding the ſolids, thereby gently removing or preventing thoſe obſtructions, which are the great and general cauſe of moſt chronical diſeaſes; in this manner anſwering to the antihyſterics, aſſa fœtida, galbanum, myrrh, amber, and in general, to all the reſins and gums of trees or ſhrubs uſeful in nervous caſes.

52. Warm water is it ſelf a deobſtruent. Therefore the infuſion of tar drunk warm, is eaſier inſinuated into all the nice capillary veſſels, and acts, not only by virtue of the balſam, but alſo by that of the vehicle. It's taſte, it's diuretic quality, its being ſo great a cordial, ſhew the activity of this medicine. And at the ſame time that it quickens the ſluggiſh blood of the hyſterical, its balſamic oily nature abates the too rapid motion of the ſharp thin blood in thoſe who are hectic. There is a lentour and ſmoothneſs in the blood of healthy ſtrong people, on

the contrary, there is often an acrimony and ſolution in that of weakly morbid perſons. The fine particles of Tar are not only warm and active, they are alſo balſamic and emollient, ſoftening and enriching the ſharp and vapid blood, and healing the eroſions occaſioned thereby in the blood veſſels and glands.

53. TAR water poſſeſſeth the ſtomachic and cardiac qualities of elixir proprietatis, Stoughton's drops, and many ſuch tinctures and extracts, with this difference, that it worketh it's effect more ſafely, as it hath nothing of that ſpirit of wine, which, however mixed and diſguiſed, may yet be well accounted a poiſon in ſome degree.

54. SUCH medicines are ſuppoſed to be diaphoretic, which being of an active and ſubtile nature, paſs through the whole ſyſtem, and work their effect in the fineſt capillaries and perſpiratory ducts, which they gently cleanſe and open. Tar water is extremely well fitted to work by ſuch an inſenſible diaphoreſis, by the fineneſs and activity of it's acid volatile ſpirit. And ſurely thoſe parts ought to be very fine, which can ſcour the perſpiratory ducts, under the ſcarf skin or

cuticle, if it be true that one grain of ſand, wou'd cover the mouths of more than a hundred thouſand.

55. ANOTHER way wherein tar water operates, is by urine, than which perhaps none is more ſafe and effectual, for cleanſing the blood and carrying off it's ſalts. But it ſeems to produce it's principal effect as an alterative, ſure and eaſy, much ſafer than thoſe vehement purgative, emetic, and ſalivating medicines, which do violence to nature.

56. AN obſtruction of ſome veſſels cauſeth the blood to move more ſwiftly in other veſſels, which are not obſtructed. Hence manifold diſorders. A liquour that dilutes and attenuates reſolves the concretions which obſtruct. Tar water is ſuch a liquour. It may be ſaid, indeed, of common water, that it attenuates, alſo of mercurial preparations that they attenuate. But it ſhou'd be conſidered that mere water only diſtends the veſſels and thereby weakens their tone; and that Mercury by it's great momentum may juſtly be ſuſpected of hurting the fine capillaries, which two deobſtruents therefore might eaſily overact their parts, and (by leſ-

ſening the force of the elaſtic veſſels) remotely produce thoſe concretions they are intended to remove.

57. Weak and rigid fibres are looked on by the moſt able phyſicians, as ſources of two different claſſes of diſtempers: a ſluggiſh motion of the liquids occaſions weak fibres: therefore tar water is good to ſtrengthen them as it gently accelerates their contents. On the other hand, being an unctuous bland fluid it moiſtens and ſoftens the dry and ſtiff fibres: and ſo proves a remedy for both extremes.

58. Common ſoaps are compoſitions of lixivial ſalt and oyl. The corroſive acrimony of the ſaline particles, being ſoftened by the mixture of an unctuous ſubſtance they inſinuate themſelves into the ſmall ducts with leſs difficulty and danger. The combination of theſe different ſubſtances makes up a very ſubtile and active medicine, fitted for mixing with all humours, and reſolving all obſtructions. Soap therefore is juſtly eſteemed a moſt efficacious medicine in many diſtempers. Alcaline ſoap is allowed to be cleanſing, attenuating, opening, reſolving, ſweetening; it is pectoral, vulnerary, diuretic, and hath other good qualities which are alſo to be found in

tar water. It is granted, that oyl and acid ſalts combined together exiſt in vegetables, and that conſequently there are acid ſoaps as well as alcaline. And the ſaponaceous nature of the acid vegetable ſpirits, is what renders them ſo diuretic, ſudorific, penetrating, abſterſive and reſolving. Such, for inſtance, is the acid ſpirit of Guaiacum. And all theſe ſame virtues ſeem to be in tar water in a mild and ſalutary degree.

59. It is the general opinion that all acids coagulate the blood. Boerhaave excepts vinegar which he holds to be a ſoap, inaſmuch as it is found to contain an oyl as well as an acid ſpirit. Hence it is both unctuous and penetrating, a powerful antiphlogiſtic, and preſervative againſt corruption and infection. Now it ſeems evident that tar water is a ſoap as well as vinegar. For though it be the character of reſin, which is an inſpiſſated groſs oyl, not to diſſolve in water (*a*), yet the ſalts attract ſome fine particles of eſſential oyl: which fine oyl ſerves as a vehicle for the acid ſalts, and ſhews it ſelf in the colour of the tar water: for all pure ſalts are colourleſs. And though the reſin will not diſſolve in water, yet the ſubtile oyl, in which the vegeta-

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(*a*) *Sect.* 47.

ble ſalts are lodged, may as well mix with water as vinegar doth, which contains both oyl and ſalt. And as the oyl in tar water diſcovers it ſelf to the eye, ſo the acid ſalts do manifeſt themſelves to the taſte. Tar water therefore is a ſoap and as ſuch hath the medicinal qualities of ſoaps.

60. It operates more gently as the acid ſalts loſe their acrimony being ſheathed in oyl, and thereby approaching the nature of neutral ſalts, are more benign and friendly to the animal ſyſtem: and more effectually, as by the help of a volatile ſmooth inſinuating oyl, thoſe ſame ſalts are more eaſily introduced into the capillary ducts. Therefore in fevers and epidemical diſtempers it is (and I have found it ſo) as well as in chronical diſeaſes, a moſt ſafe and efficacious medicine, being good againſt too great fluidity as a balſamic, and good againſt viſcidity as a ſoap. There is ſomething in the fiery corroſive nature of lixivial ſalts, which makes alcaline ſoap a dangerous remedy in all caſes where an inflammation is apprehended. And as inflammations are often occaſioned by obſtructions, it ſhou'd ſeem an acid ſoap was much the ſafer deobſtruent.

61. Even the beſt turpentines, however famous for their vulnerary and detergent qualities, have yet been obſerved by their warmth to diſpoſe to inflammatory tumours. But the acid ſpirit (*e*) being in ſo great proportion in tar water renders it a cooler and ſafer medicine. And the ætherial oyl of turpentine though an admirable dryer, healer, and anodyne, when outwardly applied to wounds and ulcers, and not leſs uſeful in cleanſing the urinary paſſages and healing their ulcerations, yet is known to be of a nature ſo very relaxing as ſometimes to do much miſchief. Tar water is not attended with the ſame ill effects, which I believe are owing in a great meaſure to the ætherial oyls being deprived of the acid ſpirit in diſtillation, which vellicating and contracting as a ſtimulus might have proved a counterpoiſe to the exceſſive lubricating and relaxing qualities of the oyl.

62. Woods in decoction do not ſeem to yield ſo ripe and elaborate a juice, as that which is depoſited in the cells or loculi terebinthiaci, and ſpontaneouſly oozes from them. And indeed though the balſam of Peru obtained by boiling wood and ſcumming the decoction, be a very valuable medicine and of

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(*e*) *Sect.* 7, 8.

great account in divers caſes, particularly aſthmas, nephritic pains, nervous colics and obſtructions, yet I do verily think (and I do not ſay this without experience) that Tar water is a more efficacious remedy in all thoſe caſes than even that coſtly drug.

63. It hath been already obſerved that the reſtorative pectoral antihyſterical virtues of the moſt precious balſams and gums are poſſeſſed in a high degree by tar water (*d*). And I do not know any purpoſe anſwered by the wood drinks, for which tar water may not be uſed with at leaſt equal ſucceſs. It contains the virtues even of Guaiacum which ſeems the moſt efficacious of all the woods, warming, and ſweetening the humours, diaphoretic and uſeful in gouts, dropſies and rheums, as well as in the foul diſeaſe. Nor ſhou'd it ſeem ſtrange, if the virtues obtained by boiling an old dry wood prove inferior to thoſe extracted from a balſam.

64. There is a fine volatile ſpirit in the waters of Geronſter, the moſt eſteemed of all the fountains about Spa, but whoſe waters do not bear tranſporting. The ſtomachic, cardiac and diuretic qualities of this fountain ſomewhat

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(*d*) *Sect.* 9, 21, 22, 23.

what reſemble thoſe of tar water, which, if I am not greatly miſtaken, contains the virtues of the beſt chalybeat and ſulphureous waters; with this difference that thoſe waters are apt to affect the head in taking, which tar water is not. Beſides, there is a regimen of diet to be obſerved, eſpecially with chalybeat waters; which I never found neceſſary with this. Tar water layeth under no reſtraint either as to diet, hours, or employment. A man may ſtudy or exerciſe or repoſe, keep his own hours, paſs his time either within or without, and take wholeſome nouriſhment of any kind.

65. The uſe of chalybeat waters, however excellent for the nerves and ſtomach, is often ſuſpended by colds and inflammatory diſorders; in which they are acknowledged to be very dangerous. Whereas tar water is ſo far from hurting in thoſe caſes, or being diſcontinued on that account, that it greatly contributes to their cure (*f*.)

66. Cordials, vulgarly ſo called, act immediately on the ſtomach, and by conſent of nerves on the head. But medicines of an operation too fine and light to produce a ſenſible effect in the primæ viæ, may, nevertheleſs,

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(*f*) *Sect.* 7.

theleſs, in their paſſage through the capillaries, operate on the ſides of thoſe ſmall veſſels, in ſuch manner as to quicken their oſcillations, and conſequently the motion of their contents, producing in iſſue and effect, all the benefits of a cordial much more laſting and ſalutary than thoſe of fermented ſpirits, which by their cauſtic and coagulating qualities do incomparably more miſchief than good. Such a cardiac medicine is tar water. The tranſient fits of mirth, produced from fermented liquors, are attended with proportionable depreſſions of ſpirit in their intervals. But the calm chearfulneſs ariſing from this water of health (as it may be juſtly called) is permanent. In which it emulates the virtues of that famous plant Gen Seng, ſo much valued in China as the only cordial that raiſeth the ſpirits without depreſſing them. Tar water is ſo far from hurting the nerves as common cordials do, that it is highly uſeful in cramps, ſpaſms of the viſcera, and paralytic numbneſs.

67. **Emetics** are on certain occaſions adminiſtred with great ſucceſs. But the overſtraining and weakening of nature may be very juſtly apprehended from a courſe of emetics. They are nevertheleſs preſcribed and

ſubſtituted for exerciſe. But it is well remarked in Plato's Timæus that vomits and purges are the worſt exerciſe in the world. There is ſomething in the mild operation of tar water, that ſeems more friendly to the œconomy, and forwards the digeſtions and ſecretions in a way more natural and benign, the mildneſs of this medicine being ſuch that I have known children take it, for above ſix months together, with great benefit, and without any inconvenience; and after long and repeated experience I do eſteem it a moſt excellent diet drink fitted to all ſeaſons and ages.

68. It is I think allowed that the origine of the gout lies in a faulty digeſtion. And it is remarked by the ableſt phyſicians, that the gout is ſo difficult to cure, becauſe heating medicines aggravate it's immediate, and cooling it's remote cauſe. But tar water, although it contain active principles that ſtrengthen the digeſtion beyond any thing I know, and conſequently muſt be highly uſeful, either to prevent or leſſen the following fit, or by invigorating the blood to caſt it upon the extremities, yet it is not of ſo heating a nature as to do harm even in the fit. Nothing is more difficult or diſagreeable than to argue men out of their prejudices, I ſhall not therefore

enter into controverſies on this ſubject, but if men diſpute and object, ſhall leave the deciſion to time and tryal.

69. In the modern practice, ſoap, opium, and mercury bid faireſt for univerſal medicines. The firſt of theſe is highly ſpoken of. But then thoſe who magnify it moſt, except againſt the uſe of it in ſuch caſes where the obſtruction is attended with a putrefactive alkali, or where an inflammatory diſpoſition appears. It is acknowledged to be very dangerous in a pthiſis, fever, and ſome other caſes in which Tar water is not only ſafe but uſeful.

70. Opium though a medicine of great extent and efficacy, yet is frequently known to produce grievous diſorders in hyſterical or hypochondriacal perſons, who make a great part, perhaps the greateſt, of thoſe who lead ſedentary lives in theſe iſlands. Beſides, upon all conſtitutions dangerous errours may be committed in the uſe of opium.

71. Mercury hath of late years become a medicine of very general uſe. The extreme minuteneſs, mobility, and momentum of its parts, rendering it a moſt powerful cleanſer of

all obſtructions, even in the moſt minute capillaries. But then we ſhould be cautious in the uſe of it, if we conſider, that the very thing which gives it power of doing good above other deobſtruents, doth alſo diſpoſe it to do miſchief. I mean it's great momentum, the weight of it being about ten times that of blood, and the momentum being the joint product of the weight and velocity, it muſt needs operate with great force; and may it not be juſtly feared, that ſo great a force entering the minuteſt veſſels, and breaking the obſtructed matter, might alſo break or wound the fine tender coats of thoſe ſmall veſſels, and ſo bring on the untimely effects of old age, producing more, perhaps, and worſe obſtructions than thoſe it removed? Similar conſequences may juſtly be apprehended from other mineral and ponderous medicines. Therefore, upon the whole, there will not perhaps be found any medicine, more general in it's uſe, or more ſalutary in it's effects than tar water.

72. To ſuppoſe that all diſtempers ariſing from very different, and it may be from contrary cauſes, can be cured by one and the ſame medicine muſt ſeem chimærical. But it may with truth be affirmed, that the virtue

of tar water extends to a ſurpriſing variety of caſes very diſtant and unlike (*b*). This I have experienced in my neighbours, my family, and my ſelf. And as I live in a remote corner among poor neighbours, who for want of a regular phyſician have often recourſe to me, I have had frequent opportunities of tryal, which convince me it is of ſo juſt a temperament as to be an enemy to all extremes. I have known it do great good in a cold watery conſtitution, as a cardiac and ſtomachic; and at the ſame time allay heat and feveriſh thirſt in another. I have known it correct coſtive habits in ſome, and the contrary habit in others. Nor will this ſeem incredible if it be conſidered that middle qualities naturally reduce the extreme. Warm water, for inſtance, mixed with hot and cold will leſſen the heat in that, and the cold in this.

73. THEY who know the great virtues of common ſoap, whoſe coarſe lixivial ſalts are the product of culinary fire, will not think it incredible, that virtues of mighty force and extent ſhould be found in a fine acid ſoap (*g*), the ſalts and oyl whereof, are a moſt elaborate product of nature and the ſolar light.

74. IT

(*b*) *Sect.* 3, 4, 5, 6, 21, *&c.* (*g*) 58.

74. It is certain tar water warms, and therefore ſome may perhaps ſtill think it cannot cool. The more effectually to remove this prejudice, let it be farther conſidered, that as on the one hand, oppoſite cauſes do ſometimes produce the ſame effect, for inſtance, heat by rarefaction and cold by condenſation do both increaſe the air's elaſticity: ſo on the other hand, the ſame cauſe ſhall ſometime produce oppoſite effects: heat for inſtance in one degree thins, in another coagulates the blood. It is not therefore ſtrange that tar water ſhou'd warm one habit, and cool another, have one good effect on a cold conſtitution, and another good effect on an inflamed one; nor, if this be ſo, that it ſhou'd cure oppoſite diſorders. All which juſtifies to reaſon, what I have often found true in fact. The ſalts, the ſpirits, the heat of tar water are of a temperature congenial to the conſtitution of a man which receives from it a kindly warmth, but no inflaming heat. It was remarkable that two children in my neighbourhood, being in a courſe of tar water, upon an intermiſſion of it, never failed to have their iſſues inflamed by an humour much more hot and ſharp than at other times. But it's great uſe in the ſmall-pox, pleuriſies, and fe-

vers,

vers, is a ſufficient proof that tar water is not of an inflaming nature.

75. I HAVE dwelt the longer on this head, becauſe ſome gentlemen of the faculty have thought fit to declare that tar water muſt enflame, and that they would never viſit any patient in a fever, who had been a drinker of it. But I will venture to affirm, that it is ſo far from increaſing a feveriſh inflammation, that it is on the contrary a moſt ready means to allay and extinguiſh it. It is of admirable uſe in fevers, being at the ſame time the ſureſt ſafeſt and moſt effectual both paregoric and cordial; for the truth of which, I appeal to any perſon's experience, who ſhall take a large draught of it milk warm in the paroxyſm of a fever, even when plain water or herb teas ſhall be found to have little or no effect. To me it ſeems that it's ſingular and ſurprizing uſe in fevers of all kinds, were there nothing elſe, would be alone ſufficient to recommend it to the public.

76. The beſt phyſicians make the idea of a fever to conſiſt in a too great velocity of the heart's motion, and too great reſiſtance at the capillaries. Tar water, as it ſoftens and gently ſtimulates thoſe nice veſſels, helps to pro-

pel their contents, and ſo contributes to remove the later part of the diſorder. And for the former, the irritating acrimony which accelerates the motion of the heart is diluted by watery, corrected by acid, and ſoftened by balſamic remedies, all which intentions are anſwered by this aqueous acid balſamic medicine. Beſides, the viſcid juices coagulated by the febrile heat are reſolved by tar water as a ſoap, and not too far reſolved, as it is a gentle acid ſoap; to which we may add, that the peccant humours and ſalts are carried off by it's diaphoretic and diuretic qualities.

77. I found all this confirmed by my own experience in the late ſickly ſeaſon of the year one thouſand ſeven hundred and forty one, having had twenty five fevers in my own family cured by this medicinal water, drunk copiouſly. The ſame method was practiſed on ſeveral of my poor neighbours with equal ſucceſs. It ſuddenly calmed the feveriſh anxieties, and ſeemed every glaſs to refreſh, and infuſe life and ſpirit into the patient. At firſt ſome of thoſe patients had been vomited, but afterwards I found that without vomiting, bleeding, bliſtering or any other evacuation or medicine whatever, very bad fevers cou'd be cured by the ſole drinking of tar water milk

warm, and in good quantity, perhaps a large glaſs every hour taken in bed. And it was remarkable, that ſuch as were cured by this comfortable cordial, recovered health and ſpirits at once, while thoſe who had been cured by evacuations often languiſhed long, even after the fever had left them, before they cou'd recover of their medicines and regain their ſtrength.

78. In peripneumonies and pleuriſies I have obſerved tar water to be excellent, having known ſome pleuritic perſons cured without bleeding, by a bliſter early applied to the ſtitch, and the copious drinking of tar water, four or five quarts, or even more in four and twenty hours. And I do recommend it to farther tryal, whether in all caſes of a pleuriſy, one moderate bleeding, a bliſter on the ſpot and plenty of tepid tar water may not ſuffice, without thoſe repeated and immoderate bleedings, the bad effects of which are perhaps never got over. I do even ſuſpect that a pleuritic patient betaking himſelf to bed betimes, and drinking very copiouſly of tar water, may be cured by that alone without bleeding, bliſtering, or any other medicine whatſoever.

79. I HAVE known a bloody flux of long continuance, after divers medicines had been tryed in vain, cured by tar water. But that which I take to be the moſt ſpeedy and effectual remedy in a bloody flux, is a clyſter of an ounce of common brown roſin diſſolved over a fire in two ounces of oyl, and added to a pint of broth, which not long ſince I had frequent occaſion of trying when that diſtemper was epidemical. Nor can I ſay that any to whom I adviſed it miſcarried. This experiment I was led to make by the opinion I had of tar as a balſamic: and roſin is only tar inſpiſſated.

80. NOTHING that I know corroborates the ſtomach ſo much as tar water (*a*). Whence it follows, that it muſt be of ſingular uſe to perſons afflicted with the gout. And from what I have obſerved in five or ſix inſtances, I do verily believe it the beſt and ſafeſt medicine either to prevent the gout, or ſo to ſtrengthen nature againſt the fit, as to drive it from the vitals. Doctor Sydenham in his treatiſe of the gout, declares, that whoever finds a medicine the moſt efficacious for ſtrengthening digeſtion, will do more ſervice in the cure of that and other chronical diſtempers,

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(*a*) *Sect.* 68.

pers, than he can even form a notion of. And I leave it to tryal, whether tar water be not that medicine, as I my ſelf am perſuaded it is, by all the experiments I cou'd make. But in all tryals I wou'd recommend diſcretion; for inſtance, a man with the gout in his ſtomach ought not to drink cold tar water. This eſſay leaves room for future experiment in every part of it, not pretending to be a complete treatiſe.

81. It is evident to ſenſe, that blood, urine, and other animal juices, being let to ſtand, ſoon contract a great acrimony. Juices, therefore from a bad digeſtion, retained and ſtagnating in the body, grow ſharp and putrid. Hence a fermenting heat, the immediate cauſe of the gout. The curing this by cooling medicines, as they wou'd increaſe the antecedent cauſe, muſt be a vain attempt. On the other hand, ſpices aud ſpirituous liquors, while they contribute to remove the antecedent cauſe, or bad digeſtion, wou'd by inflaming the blood increaſe the proximate or immediate cauſe of the gout, to wit, the fermenting heat. The ſcope therefore muſt be, to find a medicine that ſhall corroborate, but not inflame. Bitter herbs are recommended;

but they are weak in compariſon of tar water.

82. THE great force of tar water, to correct the acrimony of the blood, appears in nothing more than in the cure of a gangræne, from an internal cauſe; which was performed on a ſervant of my own, by preſcribing the copious and conſtant uſe of tar water for a few weeks. From my repreſenting tar water as good for ſo many things, ſome prehaps may conclude it is good for nothing. But charity obligeth me to ſay, what I know, and what I think, howſoever it may be taken. Men may cenſure and object as they pleaſe, but I appeal to time and experiment. Effects miſimputed, caſes wrong told, circumſtances overlooked, perhaps too, perjudices and partialities againſt Truth, may for a time prevail and keep her at the bottom of her well, from whence nevertheleſs ſhe emergeth ſooner or later, and ſtrikes the eyes of all who do not keep them ſhut.

83. BOERHAAVE thinks a ſpecific may be found, for that peculiar venome, which infects the blood in the ſmall pox, and that the proſpect of ſo great a public benefit ſhould ſtir up men to ſearch for it. It's wonderful ſuc-

ceſs in preventing and mitigating that diſtemper, (*c*) wou'd incline one to ſuſpect that tar water is ſuch a ſpecific. Some think an Eryſipelas and the plague differ only in degree. If ſo, tar water ſhou'd be uſeful in the plague, for I have known it cure an Eryſipelas.

84. Tar water, as cleanſing, healing, and balſamic, is good in all diſorders of the urinary paſſages, whether obſtructed or ulcerated. Doctor Liſter ſuppoſeth, indeed, that turpentines act by a cauſtic quality, which irritates the coats of the urinary ducts to expell ſand or gravel. But it ſhou'd ſeem this expelling diuretic virtue, conſiſted rather in the ſalts than the reſin, and conſequently reſides in the tar water, gently ſtimulating by it's ſalts, without the dangerous force of a cauſtic. The violent operation of Ipecacuanha lies in it's reſin, but the ſaline extract is a gentle purge and diuretic, by the ſtimulus of it's ſalts.

85. That which acts as a mild cordial, (*d*) neither hurting the capillary veſſels as a cauſtic, nor affecting the nerves, nor coagulating the juices, muſt in all caſes be a friend to nature, and aſſiſt the vis vitæ in its ſtruggle againſt

(*c*) 2, 3. (*d*) 66.

againſt all kinds of contagion. And from what I have obſerved, tar water appears to me an uſeful preſervative in all epidemical diſorders, and againſt all other infection whatſoever, as well as that of the ſmall pox. What effects the animi pathemata have in humane maladies, is well known, and conſequently the general benefit of ſuch a cardiac cannot be doubted.

86. As the body is ſaid to cloath the ſoul, ſo the nerves may be ſaid to conſtitute her inner garment. And as the ſoul animates the whole, what nearly touches the ſoul relates to all. Therefore the aſperity of tartarous ſalts, and the fiery acrimony of alcaline ſalts, irritating and wounding the nerves, produce naſcent paſſions and anxieties in the ſoul; which both aggravate diſtempers, and render men's lives reſtleſs and wretched, even when they are afflicted with no apparent diſtemper. This is the latent ſpring of much woe, ſpleen, and tædium vitæ. Small imperceptible irritations of the minuteſt fibres or filaments cauſed by the pungent ſalts of wines and ſauces, do ſo ſhake and diſturb the microcoſms of high livers, as often to raiſe tempeſts in courts and ſenates. Whereas the gentle vibrations that are raiſed in the nerves, by a fine ſubtile acid,

ſheathed in a ſmooth volatile oyl (*e*), ſoftly ſtimulating and bracing the nervous veſſels and fibres, promotes a due circulation and ſecretion of the animal juices, and creates a calm ſatisfied ſenſe of health. And accordingly I have often known tar water procure ſleep and compoſe the ſpirits in cruel vigils, occaſioned either by ſickneſs or by too intenſe application of mind.

87. In diſeaſes ſometimes accidents happen from without by miſmanagement, ſometimes latent cauſes operate within, jointly with the ſpecific taint or peculiar cauſe of the malady. The cauſes of diſtempers are often complicated, and there may be ſomething in the idioſyncraſy of the patient that puzzles the phyſician. It may therefore be preſumed that no medicine is infallible, not even in any one diſorder. But as tar water poſſeſſeth the virtues of fortifying the ſtomach, as well as purifying and invigorating the blood, beyond any medicine that I know, it may be preſumed of great and general efficacy in all thoſe numerous illneſſes, which take their riſe from foul or vapid blood, or from a bad digeſtion. The animal ſpirits are elaborated from the blood. Such therefore as the

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(*e*) 59, 61.

the blood is, ſuch will be the animal ſpirit, more or leſs, weaker or ſtronger. This ſheweth the uſefulneſs of tar water in all hyſteric and hypocondriac caſes; which together with the maladies from indigeſtion compriſe almoſt the whole tribe of chronical diſeaſes.

88. The ſcurvy may be reckoned in theſe climates an univerſal malady, as people in general are ſubject to it, and as it mixes more or leſs in almoſt all diſeaſes. Whether this proceeds from want of elaſticity in our air, upon which the tone of the veſſels depends, and upon that the ſeveral ſecretions: or whether it proceeds from the moiſture of our climate, or the groſſneſs of our food, or the ſalts in our atmoſphere, or from all theſe together. Thus much at leaſt ſeems not abſurd to ſuppoſe that, as phyſicians in Spain and Italy are apt to ſuſpect the venereal taint to be a latent principle, and bear a part in every illneſs, ſo for as good reaſon the ſcurvy ſhould be conſidered by our phyſicians, as having ſome ſhare in moſt diſorders and conſtitutions that fall in their way. It is certain our perſpiration is not ſo free as in clearer air and warmer climates. Perſpirable humours not diſcharged will ſtagnate and peutriſy. A diet of animal food will be apt to render the juices of our bodies alcaleſcent.

Hence ichorous and corroſive humours and many diſorders. Moiſt air makes viſcid blood; and ſaline air inflames this viſcid blood. Hence broken capillaries, extravaſated blood, ſpots and ulcers, and other ſcorbutic ſymptoms. The body of a man attracts and imbibes the moiſture and ſalts of the air, and whatever floats in the atmoſphere, which as it is common to all, ſo it affects all more or leſs.

89. Doctor Muſgrave thinks the Devonſhire ſcurvy a relique of the leproſy, and that it is not owing to the qualities of the air. But as theſe inſulars in general live in a groſs ſaline air, and their veſſels being leſs elaſtic, are conſequently leſs able to ſubdue and caſt off what their bodies as ſponges draw in, one would be tempted to ſuſpect the air not a little concerned, eſpecially in ſuch a ſituation as that of Devonſhire. In all theſe Britiſh iſlands we enjoy a great mediocrity of climate, the effect whereof is, that we have neither heat enough to exalt and diſſipate the groſs vapours, as in Italy, nor cold enough to condenſe and precipitate them, as in Sweden. So they are left floating in the air, which we conſtantly breath, and imbibe through the whole ſurface of our bodies. And this together with exhalations from coal fires,

and the various foſſils wherein we abound, doth greatly contribute to render us ſcorbutic and hypochondriac.

90. THERE are ſome who derive all diſeaſes from the ſcurvy, which indeed muſt be allowed to create or mimic moſt other maladies. Boerhaave tells us, it produceth pleuritic, cholic, nephritic, hepatic pains, various fevers, hot, malignant, intermitting, dyſenteries, faintings, anxieties, dropſies, conſumptions, convulſions, palſies, fluxes of blood. In a word, it may be ſaid to contain the ſeeds and origine of almoſt all diſtempers. Inſomuch that a medicine which cures all ſorts of ſcurvy, may be preſumed good for moſt other maladies.

91. THE ſcurvy, doth not only in variety of ſymptoms imitate moſt diſtempers, but alſo when come to a height, in degree of virulence equal the moſt malignant. Of this we have a remarkable proof, in that horrible deſcription of the ſcorbutic patients in the hoſpitals of Paris, given by monſieur Ponpart, in the memoirs of the royal academy of ſciences, for the year one thouſand ſix hundred and ninety nine. That author thinks he ſaw ſome reſemblance in it to the plague of Athens. It is

hard to imagine any thing more dreadful than the caſe of thoſe men, rotting alive by the ſcurvy in it's ſupreme degree. To obviate ſuch putrefaction, I believe the moſt effectual method wou'd be, to embalm (if one may ſo ſay) the living body with tar water copiouſly drunk; and this belief is not without experience.

92. It is the received opinion that the animal ſalts of a ſound body are of a neutral, bland, and benign nature: that is, the ſalts in the juices paſt the primæ viæ, are neither acid nor alcaline, having been ſubdued by the conſtitution, and changed into a third nature. Where the conſtitution wants force to do this, the aliment is not duly aſſimilated; and ſo far as the ſalts retain their priſtine qualities, ſickly ſymptoms enſue, acids and alkalies not perfectly ſubdued, producing weak ferments in the juices. Hence ſcurvy, cachexy, and a long train of ills.

93. A Cachexy or ill habit is much of the ſame kind with the ſcurvy, proceeds from the ſame cauſes and is attended with like ſymptoms, which are ſo manifold and various, that the ſcurvy may well be looked on as a general cachexy, infecting the whole habit

and vitiating all the digeſtions. Some have reckoned as many ſorts of the ſcurvy, as there are different taints of the blood. Others have ſuppoſed it a collection of all illneſſes together. Some ſuppoſe it an accumulation of ſeveral diſeaſes in fieri. Others take it for an aſſemblage of the reliques of old diſtempers.

94. BUT thus much is certain, the cure of the ſcurvy is no more to be attempted by ſtrongly active medicines than (to uſe the ſimilitude of an ingenious writer,) a thorn in the fleſh, or pitch on ſilk to be removed by force. The viſcid humour muſt be gently reſolved and diluted, the tone of the veſſels recovered by a moderate ſtimulation, and the tender fibres and capillary veſſels gradually cleared from the concreted ſtuff, that adheres and obſtructs them. All which is in the apteſt manner performed by a watery diluent, containing a fine vegetable ſoap. And although a compleat cure by alteratives, operating on the ſmall capillaries, and by inſenſible diſcharges, muſt require length of time, yet the good effect of this medicine on cachectic and ſcorbutic perſons, is ſoon perceived, by the change it produceth in their pale diſcoloured looks, giving a florid healthy countenance

in leſs time than perhaps any other medicine.

95 It is ſuppoſed by phyſicians, that the immediate cauſe of the ſcurvy lies in the blood, the fibrous part of which is too thick and the ſerum too thin and ſharp: and that hence ariſeth the great difficulty in the cure, becauſe in the correcting of one part, regard muſt be had to the other. It is well known, how extremely difficult it is to cure an inveterate ſcurvy: how many ſcorbutic patients have grown worſe by an injudicious courſe of evacuations: how many are even rendered incurable by the treatment of inconſiderate phyſicians: and how difficult, tedious and uncertain the cure is in the hands even of the beſt, who are obliged to uſe ſuch variety and change of medicines, in the different ſtages of that malady: which nevertheleſs may be cured (if I may judge by what I have experienced) by the ſole, regular, conſtant, copious, uſe of tar water.

96. Tar water moderately inſpiſſates with it's balſamic virtue, and renders mild the thin and ſharp part of the blood. The ſame, as a ſoapy medicine, diſſolves the grumous concre-

tions of the fibrous part. As a balſam it deſtroys the ulcerous acrimony of the humours, and as a deobſtruent it opens and cleans the veſſels, reſtores their tone, and ſtrengthens the digeſtion, whoſe defects are the principal cauſe of ſcurvy and cachexy.

97. IN the cure of the ſcurvy, the principal aim is to ſubdue the acrimony of the blood and juices. But as this acrimony proceeds from different cauſes, or even oppoſite, as acid and alkaline, what is good in one ſort of ſcurvy proves dangerous, or even mortal, in another. It is well known, that hot antiſcorbutics, where the juices of the body are alcaleſcent, increaſe the diſeaſe. And ſour fruits and vegetables produce a like effect in the ſcurvy, cauſed by an acid acrimony. Hence fatal blunders are committed by unwary practitioners, who, not diſtinguiſhing the nature of the diſeaſe, do frequently aggravate, inſtead of curing it. If I may truſt what tryals I have been able to make, this water is good in the ſeveral kinds of ſcurvy, acid, alcaline, and muriatic, and I believe it the only medicine that cures them all without doing hurt in any. As it contains a volatile acid (*a*) with a fine volatile oyl, why may not a medicine cool in

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(*a*) 7.

one part and warm in another be a remedy to either extreme (*c*). I have obſerved it to produce a kindly genial warmth without heat, a thing to be aimed at in all ſorts of ſcurvy. Beſides, the balſam in tar water ſheaths all ſcorbutic ſalts alike: and its great virtues as a digeſter and deobſtruent are of general uſe in all ſcorbutic, and I may add, in all chronical caſes whatſoever.

98. I CANNOT be ſure that I have tried it in a ſcrophulous caſe, though I have tried it ſucceſsfully in one that I ſuſpected to be ſo. And I apprehend it wou'd be very ſerviceable in ſuch diſorders. For although Doctor Gibbs in his treatiſe on the King's Evil derives that diſeaſe from a coagulating acid, which is alſo agreeable to the opinion of ſome other phyſicians, and although tar water contain an acid, yet, as it is a ſoap (*d*), it reſolves inſtead of coagulating the juices of the body.

99. FOR hyſterical and hypocondriacal diſorders ſo frequent among us, it is commonly ſuppoſed that all acids are bad. But I will venture to except the acid ſoap of tar water, having found by my own experience and that of many others, that it raiſes the ſpirits, and is an

(*c*) 72. (*d*) 58.

an excellent antihyſteric, nor leſs innocent than potent, which cannot be ſaid of thoſe others in common uſe, that often leave people worſe than they found them.

100. In a high degree of ſcurvy a mercurial ſalivation is looked on by many as the only cure. Which by the vehement choque it gives the whole frame, and the ſenſible ſecretion it produceth may be thought more adequate to ſuch an effect. But the diſorder occaſioned by that violent proceſs, it is to be feared, may never be got over. The immediate danger, the frequent bad effects, the extreme trouble and nice care attending ſuch a courſe do very deſervedly make people afraid of it. And though the ſenſible ſecretion therein be ſo great, yet in a longer tract of time the uſe of tar water may produce as great a diſcharge of ſcorbutic ſalts by urine and by perſpiration, the effect of which laſt, though not ſo ſenſible, may yet be greater than that of Salivation; eſpecially if it be true, that in common life inſenſible perſpiration is to nutrition, and all ſenſible excretions as five to three.

101. Many hyſteric and ſcorbutic ailments, many taints contracted by themſelves, or inherited from their anceſtors, afflict the people

of condition in theſe iſlands, often rendering them, upon the whole, much more unhappy than thoſe whom poverty and labour have ranked in the loweſt lot of life; which ailments might be ſafely removed or relieved by the ſole uſe of tar water; And thoſe lives which ſeem hardly worth living for bad appetite, low ſpirits, reſtleſs nights, waſting pains and anxieties, be rendered eaſy and comfortable.

102. As the nerves are inſtruments of ſenſation, it follows that ſpaſms in the nerves may produce all ſymptoms, and therefore a diſorder in the nervous ſyſtem ſhall imitate all diſtempers, and occaſion, in appearance, an aſthma for inſtance, a pleuriſy, or a fit of the ſtone. Now whatever is good for the nerves in general, is good againſt all ſuch ſymptoms. But tar water, as it includes in an eminent degree the virtues of warm gums and reſins, is of great uſe for comforting and ſtrengthening the nerves (*e*), curing twitches in the nervous fibres, cramps alſo, and numbneſs in the limbs, removing anxieties and promoting ſleep, in all which caſes I have known it very ſucceſsful.

(*e*) 86.

103. This ſafe and cheap medicine ſuits all circumſtances and all conſtitutions, operating eaſily, curing without diſturbing, raiſing the ſpirits without depreſſing them, a circumſtance that deſerves repeated attention, eſpecially in theſe climates, where ſtrong liquors ſo fatally and ſo frequently produce thoſe very diſtreſſes they are deſigned to remedy; and, if I am not miſinformed, even among the Ladies themſelves, who are truly much to be pitied. Their condition of life makes them a prey to imaginary woes, which never fail to grow up in minds unexerciſed and unemploy'd. To get rid of theſe, it is ſaid, there are, who betake themſelves to diſtilled ſpirits. And it is not improbable, they are led gradually to the uſe of thoſe poiſons by a certain complaiſant pharmacy, too much uſed in the modern practice, palſy drops, poppy cordial, plague water, and ſuch like, which being in truth nothing but drams diſguiſed, yet coming from the apothecaries, are conſidered only as medicines.

104. The ſoul of man was ſuppoſed by many ancient ſages, to be thruſt into the humane body as into a priſon, for puniſhment of

paſt offences. But the worſt priſon is the body of an indolent Epicure, whoſe blood is inflamed by fermented liquors (*f*) and high ſauces, or render'd putrid, ſharp, and corroſive, by a ſtagnation of the animal juices through ſloth and indolence; whoſe membranes are irritated by pungent ſalts; whoſe mind is agitated by painful oſcillations of the nervous (*g*) ſyſtem, and whoſe nerves are mutually affected by the irregular paſſions of his mind. This ferment in the animal œconomy darkens and confounds the intellect. It produceth vain terrours and vain conceits, and ſtimulates the ſoul with mad deſires, which, not being natural, nothing in nature can ſatisfy. No wonder, therefore, there are ſo many fine perſons of both ſexes, ſhining themſelves, and ſhone on by fortune, who are inwardly miſerable and ſick of life.

105. THE hardneſs of ſtubbed vulgar conſtitutions, renders them inſenſible of a thouſand things, that fret and gall thoſe delicate people, who, as if their ſkin was peeled off, feel to the quick every thing that touches them. The remedy for this exquiſite and painful ſenſibility is commonly ſought from fermented, perhaps from diſtilled, liquors which

(*f*) 66. (*g*) 86.

which render many lives wretched, that wou'd otherwiſe have been only ridiculous. The tender nerves, and low ſpirits of ſuch poor creatures, wou'd be much relieved by the uſe of tar water, which might prolong and cheer their lives. I do therefore recommend to them the uſe of a cordial, not only ſafe and innocent, but giving health and ſpirit as ſurely as other cordials deſtroy them.

106. I DO verily think, there is not any other medicine whatſoever, ſo effectual to reſtore a crazy conſtitution, and cheer a dreary mind, or ſo likely to ſubvert that gloomy empire of the ſpleen (*h*) which tyranniſeth over the better ſort (as they are called) of theſe free nations; and maketh them, in ſpight of their liberty and property, more wretched ſlaves than even the ſubjects of abſolute power, who breath clear air in a ſunny climate. While men of low degree often enjoy a tranquility and content, that no advantage of birth or fortune can equal. Such, indeed, was the caſe, while the rich alone cou'd afford to be debauched; but when even beggars became debauchees, the caſe was altered.

(*h*) 103.

107. The public virtue and ſpirit of the Britiſh legiſlature, never ſhewed it ſelf more conſpicuous in any act, than in that for ſuppreſſing the immoderate uſe of ſpirituous liquors among the people, whoſe ſtrength and numbers conſtitute the true wealth of a nation: though evaſive arts will, it is feared, prevail ſo long as deſtilled ſpirits of any kind are allowed, the character of Engliſhmen in general, being that of Brutus, Quicquid vult valde vult. But why ſhould ſuch a canker be tolerated in the vitals of a ſtate, under any pretence or in any ſhape whatſoever? Better by far, the whole preſent ſet of deſtillers were penſioners of the public, and their trade aboliſhed by law; ſince all the benefit thereof put together wou'd not balance the hundredth part of it's miſchief.

108. To prove the deſtructive effects of ſuch ſpirits with regard both to the humane ſpecies and individuals, we need not go ſo far as our colonies, or the ſavage natives of America. Plain proof may be had nearer home. For, albeit there is in every town or diſtrict throughout England, ſome tough dram-drinker, ſet up as the Devil's decoy, to draw in proſelytes; yet the ruined health and morals, and

the beggary of ſuch numbers evidently ſhew that we need no other enemy to compleat our deſtruction, than this cheap luxury at the lower end of the ſtate, and that a nation lighted up at both ends muſt ſoon be conſumed.

109. It is much to be lamented that our Inſulars, who act and think ſo much for themſelves, ſhou'd yet from groſſneſs of air and diet, grow ſtupid or doat ſooner than other people, who by virtue of elaſtic air, water-drinking, and light food, preſerve their faculties to extreme old age; an advantage which may perhaps be approached, if not equalled, even in theſe regions, by tar water, temperance, and early hours; the laſt is a ſure addition to Life, not only in regard of time, which, being taken from ſleep, the image of death, is added to the waking hours, but alſo in regard of longevity and duration in the vulgar ſenſe. I may ſay too, in regard of ſpirit and vivacity, which, within the ſame compaſs of duration, may, truly and properly be affirmed to add to man's life: it being manifeſt, that one man, by a brisker motion of his ſpirits and ſucceſſion of his ideas, ſhall live more in one hour, than another in two: and that the quantity of Life is to be eſtimated, not merely from the

duration, but alſo from the intenſeneſs of living. Which intenſe living, or, if I may ſo ſay, lively life, is not more promoted by early hours as a regimen, than by tar water as a cordial; which acts, not only as a ſlow medicine, but hath alſo an immediate and cheerful (*a*) effect on the ſpirits.

110. It muſt be owned, the light attracted ſecreted and detained in Tar, (*e*) and afterwards drawn off in it's fineſt balſamic particles, by the gentle menſtruum of cold water, is not a violent and ſudden medicine, always to produce it's effect at once, (ſuch by irritating, often do more miſchief than good) but a ſafe and mild alterative, which penetrates the whole ſyſtem, opens, heals, and ſtrengthens the remote veſſels, alters and propells their contents, and enters the minuteſt capillaries, and cannot therefore, otherwiſe, than by degrees and in time work a radical cure of chronic diſtempers. It gives nevertheleſs ſpeedy relief in moſt caſes, as I have found by my ſelf and many others. I have been ſurpriſed to ſee perſons fallen away and languiſhing under a bad digeſtion, after a few weeks recover a good ſtomach, and with it fleſh and ſtrength, ſo as to ſeem renewed, by the drinking of

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(*a*) 66. (*e*) 8, 29, 40.

of tar water. The ſtrength and quantity of this water to be taken by each individual perſon is beſt determined from experience. And as for the time of taking, I never knew any evil enſue from it's being continued ever ſo long; but, on the contrary, many and great advantages, which ſometimes would not perhaps begin to ſhew themſelves till it had been taken two or three months.

111. We learn from Pliny, that in the firſt ferment of new wine or muſtum, the ancients were wont to ſprinkle it with powdered roſin, which gave it a certain ſprightlineſs, quædam ſaporis acumina. This was eſteemed a great improver of it's odour and taſte, and was, I doubt not, of it's ſalubrity alſo. The brown old roſin, that is to ſay, harden'd tar, as being more eaſily pulverized and ſifted, was moſt in requeſt for this purpoſe. They uſed likewiſe to ſeaſon their wine veſſels with pitch or roſin. And I make no doubt, that if our vintners wou'd contrive to medicate their wines with the ſame ingredients, they might improve and preſerve them, with leſs trouble and expence to themſelves, and leſs danger to others. He that wou'd know more particulars of this matter may conſult Pliny and Columella. I ſhall only add, that I doubt not a

ſimilar improvement may be made of malt liquor.

112. THE ῥητίνη of Theophraſtus and reſina of Pliny are ſometimes uſed in a general ſenſe, to ſignify all ſorts of oily viſcid exſudations from plants or trees. The crude watery juice, that riſeth early in the ſpring, is gradually ripened and inſpiſſated by the ſolar heat, becoming in orderly ſucceſſion with the ſeaſons an oyl, a balſam, and at laſt a reſin. And it is obſerved by chymiſts, that turpentine diſſolved over a gentle fire, is, by the conſtant operation of heat, ſucceſſively transformed into oyl, balſam, pitch, and hard friable reſin, which will incorporate with oyl or rectified ſpirit, but not with water.

113. SIR John Floyer remarks, that we want a method for the uſe of turpentine, and again, he who ſhall hit, ſaith he, on the pleaſanteſt method of giving turpentine, will, do great cures in the gout, ſtone, catarrhs, dropſies and cold Scurvies, rheumatiſms, ulcers, and obſtructions of the glands. Laſtly, he ſubjoins, that for the uſe of altering and amending the juices and fibres, it muſt be given frequently, and in ſuch ſmall quantities at a time, and in ſo commodious a manner, as will

agree beſt with the ſtomach, (*d*) ſtay longeſt in the body, and not purge it ſelf off; for large doſes (ſaith he) go through too quick, and beſides offend the head. Now the infuſion of tar or turpentine in cold water ſeems to ſupply the very method that was wanted, as it leaves the more unctuous, and groſs parts behind (*f*), which might offend the ſtomach inteſtines and head; and as it may be eaſily taken, and as often, and in ſuch quantity and ſuch degree of ſtrength, as ſuits the caſe of the patient. Nor ſhou'd it ſeem, that the fine ſpirit and volatile oyl, obtained by infuſion of tar (*g*), is inferior to that of turpentine, to which it ſuperadds the virtue of wood ſoot, which is known to be very great with reſpect to the head and nerves; and this appears evident from the manner of obtaining tar (*h*). And as the fine volatile parts of tar or turpentine are obtained by infuſion in cold water and eaſily conveyed throughout the whole ſyſtem of the human body; ſo it ſhould ſeem the ſame method may be uſed with all ſorts of balſams or reſins whatſoever, as the readieſt, eaſieſt, and moſt inoffenſive, as well as in many caſes the

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(*d*) 9. (*f*) 47. (*g*) 7, 42, 58. (*h*) 13.

the moſt effectual way of obtaining and imparting their virtues.

114. AFTER having ſaid ſo much of the uſes of Tar, I muſt farther add, that it is an excellent preſervative of the teeth and gums: and that it clears and ſtrengthens the voice. And, as it's effects are various and uſeful, ſo there is nothing to be feared from the operation of an alterative ſo mild and friendly to nature. It was a wiſe maxim of certain ancient philoſophers, that diſeaſes ought not to be irritated by medicines. But no medicine diſturbs the animal œconomy leſs than this, which, if I may truſt my own experience, never produces any diſorder in a patient when rightly taken.

115. I KNEW indeed a perſon who took a large glaſs of tar water juſt before breakfaſt, which gave him an invincible nauſea and diſguſt, although he had before received the greateſt benefit from it. But if the tar water be taken and made in the manner preſcribed at the beginning of this eſſay, it will, if I miſtake not have enough of the ſalt to be uſeful, and little enough of the oyl to be inoffenſive. Perſons more delicate than ordinary

may render it palatable, by mixing a drop of the chymical oyl of nutmegs in each glaſs. It may not be amiſs to obſerve, that I have known ſome, whoſe nice ſtomachs could not bear it in the morning, take it at night going to bed without any inconvenience.

116. In very dangerous and acute caſes much may be taken and often; as far as the ſtomach can bear. But in chronical caſes, about half a pint night and morning, may ſuffice. A medicine of ſo great virtue in ſo many different diſorders, and eſpecially in that grand enemy, the fever, muſt needs be a benefit to mankind in general. There are nevertheleſs three ſorts of people to whom I wou'd peculiarly recommend it: Sea-faring perſons, Ladies, and men of ſtudious and ſedentary lives.

117. To ſailors and all ſea-faring perſons, who are ſubject to ſcorbutic diſorders and putrid fevers, eſpecially in long ſouthern voyages, I am perſuaded this tar water would be very beneficial. And this may deſerve particular notice in the preſent courſe of marine expeditions, when ſo many of our countrymen have periſhed by ſuch diſtempers, contracted at ſea and in foreign climates. Which,

it is probable, might have been prevented, by the copious uſe of Tar-water.

118. This ſame water will alſo give charitable relief to the Ladies, (*m*) who often want it more than the pariſh poor; being many of them never able to make a good meal, and ſitting pale, puny, and forbidden like ghoſts, at their own table, victims of vapours and indigeſtion.

119. Studious perſons alſo pent up in narrow holes, breathing bad air, and ſtooping over their books, are much to be pitied. As they are debarred the free uſe of air and exerciſe, this I will venture to recommend as the beſt ſuccedaneum to both. Though it were to be wiſhed, that modern ſcholars would, like the ancients, meditate and converſe more in walks and gardens and open air, which upon the whole, would perhaps be no hindrance to their learning, and a great advantage to their health. My own ſedentary courſe of life had long ſince thrown me into an ill habit, attended with many ailments particularly a nervous colic, which rendered my life a burthen, and the more ſo, becauſe my pains were exaſperated by exerciſe. But ſince

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(*m*) 103.

ſince the uſe of Tar water, I find, though not a perfect recovery from my old and rooted illneſs, yet ſuch a gradual return of health and eaſe, that I eſteem my having taken this medicine the greateſt of all temporal bleſſings, and am convinced that, under providence, I owe my life to it.

120. In the diſtilling of turpentine and other balſams by a gentle heat, it hath been obſerved, that there riſeth firſt an acid ſpirit (*n*) that will mix with water; which ſpirit, except the fire be very gentle, is loſt. This grateful acid ſpirit that firſt comes over, is, as a learned chymiſt and phyſician informs us, highly refrigeratory, diuretic, ſudorific, balſamic or preſervative from putrefaction, excellent in nephritic caſes, and for quenching thirſt, all which virtues are contained in the cold infuſion, which draws forth from Tar only it's fine flower or quinteſſence, if I may ſo ſay, or the native vegetable ſpirit, together with a little volatile oyl.

121. The diſtinguiſhing principle of all vegetables, that whereon their peculiar ſmell, taſte, and ſpecific properties depend, ſeems to be ſome extremely fine and ſubtile ſpirit, whoſe immediate vehicle is an exceeding thin

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(*n*) 7.

volatile oyl, which is it ſelf detained in a groſſer and more viſcid reſin or balſam, lodged in proper cells in the bark and ſeeds, and moſt abounding in autumn or winter, after the crude juices have been thoroughly concocted, ripened, and impregnated with ſolar light. The ſpirit it ſelf is by ſome ſuppoſed to be an oyl highly ſubtilized, ſo as to mix with water. But ſuch volatile oyl is not the ſpirit, but only it's vehicle. Since aromatic oyls being long expoſed to air, will loſe their ſpecific ſmell and taſte, which fly off with the ſpirit or vegetable ſalt, without any ſenſible diminution of the oyl.

122. Those volatile ſalts, that are ſet free and raiſed by a gentle heat, may juſtly be ſuppoſed eſſential (*a*), and to have preexiſted in the vegetable; whereas the lixivial fixed ſalts obtained by the incineration of the ſubject, whoſe natural conſtituent parts have been altered or deſtroyed by the extreme force of fire, are by later chymiſts, upon very good grounds, ſuppoſed not to have pre-exiſted therein; all ſuch ſalts appearing, from the experiments of ſignor Redi, not to preſerve the virtues of the reſpective vegetable ſubjects; and to be alike purgative and in an equal degree,

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(*a*) 8.

gree, whatſoever may be the ſhape of their points, whether ſharp or obtuſe. But although fixed or lixivious ſalts may not contain the original properties of the ſubject; yet volatile ſalts raiſed by a ſlight heat from vegetables are allowed to preſerve their native virtues: and ſuch ſalts are readily imbibed by water.

123. The moſt volatile of the ſalts, and the moſt attenuated part of the oyl, may be ſuppoſed the firſt and readieſt to impregnate a cold infuſion (*c*). And this will aſſiſt us to account for the virtues of tar water. That volatile acid in vegetables, which reſiſts putrefaction and is their great preſervative, is detained in a ſubtile oyl miſcible with water, which oyl is it ſelf impriſoned in the reſin or groſſer part of the tar, from which it is eaſily ſet free and obtained pure by cold water.

124. The mild native acids are obſerved more kindly to work upon, and more thoroughly to diſſolve, metallic bodies, than the ſtrongeſt acid ſpirits produced by a vehement fire; and it may be ſuſpected, they have the ſame advantage as a medicine. And as no acid, by the obſervation of ſome of the beſt chymiſts,

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(*c*) 1, 7.

chymiſts, can be obtained from the ſubſtance of animals thoroughly aſſimilated, it ſhould follow, that the acids received into a healthy body muſt be quite ſubdued and changed by the vital powers: but it is eaſier to ſubdue and aſſimilate (*e*) the gentler than the ſtronger acids.

125. I AM very ſenſible, that on ſuch ſubjects arguments fall ſhort of evidence: and that mine fall ſhort even of what they might have been if I enjoyed better health, or thoſe opportunities of a learned commerce, from which I am cut off in this remote corner. I ſhall nevertheleſs go on as I have begun, and proceed by reaſon, by conjecture, and by authority to caſt the beſt light I can on the obſcure paths that lie in my way.

126. SIR Iſaac Newton, Boerhaave, and Homberg are all agreed, that the acid is a fine ſubtile ſubſtance, pervading the whole terraqueous globe; which produceth divers kinds of bodies, as it is united to different ſubjects. This according to Homberg is the pure ſalt, ſalt the principle, in it ſelf ſimilar and uniform, but never found alone. And although this principle be called the ſalt of the earth,

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(*e*) 48.

earth, yet it ſhould ſeem it may more properly be called the ſalt of the air, ſince earth turned up and lying fallow receives it from the air. And it ſhould ſeem that this is the great principle of vegetation, derived into the earth from all ſorts of manures, as well as from the air. The acid is allowed to be the cauſe of fermentation in all fermented liquors. Why therefore, may it not be ſuppoſed to ferment the earth, and to conſtitute that fine penetrating principle, which introduces and aſſimilates the food of plants, and is ſo fugitive as to eſcape all the filtrations and perquiſitions of the moſt nice obſervers?

127. It is the doctrine of Sir Iſaac Newton and monſieur Homberg, that, as the watery acid is that which renders ſalt ſoluble in water, ſo it is that ſame which joined to the earthy part makes it a ſalt. Let it therefore be conſidered, that the organs (*d*) of plants are tubes, the filling, unfolding, and diſtending whereof by liquors, doth conſtitute what is called the vegetation or growth of the plant. But earth it ſelf is not ſoluble in water, ſo as to form one vegetable fluid therewith. Therefore the particles of earth muſt be joined with a watery acid, that is, they muſt become

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(*d*) 30, 31, 35.

come ſalts in order to diſſolve in water; that ſo, in the form of a vegetable juice, they may paſs through the ſtrainers and tubes of the root into the body of the plant, ſwelling and diſtending it's parts and organs, that is, increaſing it's bulk. Therefore the vegetable matter of the earth is in effect earth changed into ſalt. And to render earth fertile, is to cauſe many of its particles to aſſume a ſaline form.

128. HENCE it is obſerved, there are more ſalts in the root than in the bark, more ſalts in vegetables during the ſpring than in the autumn or winter, the crude ſaline juices being in the ſummer months partly evaporated, and partly ripened by the action and mixture of light. Hence alſo it appears, why the dividing of earth, ſo as to enlarge its ſurface, whereby it may admit more acid from the air, is of ſuch uſe in promoting vegetation. And why aſhes, lime, and burnt clay are found ſo profitable manures, fire being in reality the acid, as is proved in the ſequel. (*a*) Marls alſo and ſhells are uſeful, foraſmuch as thoſe alcaline bodies attract the acid, and raiſe an efferveſcence with it, thereby promoting a fermentation in the glebe. The excrements of animals and putrid vegetables do in like manner

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(*a*) 202.

manner contribute to vegetation, by increaſing the ſalts of the earth. And where fallows are well broken, and lye long to receive the acid of the air into all their parts; This alone will be ſufficient to change many terrene particles into ſalts, and conſequently render them ſoluble in water, and therefore fit aliment for vegetables.

129. THE acid, ſaith Homberg, is always joined to ſome ſulphur, which determines it to this or that ſpecies, producing different ſalts, as it is the vegetable, bituminous, or metallique ſulphur. Even the alkaline, whether, volatile or lixivial ſalts, are ſuppoſed to be nothing but this ſame acid ſtrictly detained by oyl and earth, in ſpight of the extreme force of fire, which lodgeth in them, without being able to diſlodge ſome remains of the acid.

130. SALTS, according to ſir Iſaac Newton, are dry earth and watery acid united by attraction, the acid rendering them ſoluble in water. (*f*) He ſuppoſeth the watery acid to flow round the terreſtrial part, as the ocean doth round the earth, being attracted thereby, and compares each particle of ſalt,

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(*f*) 127.

to a chaos whereof the innermoſt part is hard and earthy, but the ſurface ſoft and watry. Whatever attracts and is attracted moſt ſtrongly is an acid in his ſenſe.

131. It ſeems impoſſible to determine the figures of particular ſalts. All acid ſolvents together with the diſſolved bodies are apt to ſhoot into certain figures. And the figures, in which the foſſil ſalts cryſtallize, have been ſuppoſed the proper natural ſhapes of them and their acids. But Homberg hath clearly ſhewed the contrary: foraſmuch as the ſame acid diſſolving different bodies, aſſumes different ſhapes. Spirit of nitre, for inſtance, having diſſolved copper ſhoots into hexagonal cryſtals; the ſame having diſſolved iron, ſhoots into irregular ſquares; and again, having diſſolved ſilver, forms thin chryſtals of a triangular figure.

132. Homberg nevertheleſs holds in general, that acids are ſhaped like daggers, and alkalies like ſheaths: And that moving in the ſame liquor, the daggers run into the ſheaths fitted to receive them, with ſuch violence as to raiſe that effervesſence obſerved in the mixture of acids and alkalies. But it ſeems very difficult to conceive, how, or why

the mere configuration of daggers and ſheaths, floating in the ſame liquor, ſhould cauſe the former to ruſh with ſuch vehemence, and direct their points ſo aptly into the later, any more than a parcel of ſpigots and foſſets floating together in the ſame water, ſhould ruſh one into the other.

133. It ſhould ſeem rather, that the vehement attraction which ſir Iſaac Newton attributes to all acids, whereby he ſuppoſeth them to ruſh towards, penetrate, ſhake, and divide the moſt ſolid bodies, aud to ferment the liquid of vegetables, could better account for this phænomenon. It is in this attraction, that ſir Iſaac placeth all their activity, and indeed it ſhould ſeem, the figures of ſalts were not of ſuch efficacy in producing their effects, as the ſtrong attractive powers whereby they are agitated and do agitate other bodies. Eſpecially if it be true (what was before remarked) that lixivious ſalts are alike purgative, whatever may be the ſhape of their angles, whether more or leſs acute or obtuſe.

134. Sir Iſaac Newton accounts for the watry acid's making earthy corpuſcles ſoluble in water, by ſuppoſing the acid to be a mean

between earth and water, it's particles greater than thoſe of water, and leſs than thoſe of earth, and ſtrongly to attract both. But perhaps there is no neceſſary reaſon, for ſuppoſing the parts of the acid groſſer than the parts of water, in order to produce this effect; may not this as well be accounted for, by giving them only a ſtrong attraction or coheſion with the bodies to which they are joined?

135. THE acid ſpirit or ſalt, that mighty inſtrument in the hand of nature, reſiding in the air, and diffuſed throughout that whole element, is diſcernible alſo in many parts of the earth, particularly in foſſils, ſuch as ſulphur, vitriol, and alum; it was already obſerved from Homberg, that this acid is never found pure, but hath always ſulphur joined with it, and is claſſed by the difference of it's ſulphurs, whether mineral, vegetable, or animal.

136. SALTS are vulgarly reckoned the moſt active of chymical principles. But Homberg derives all their activity from the ſulphurs joined with them. From which alſo, as hath been ſaid, he derives all their kinds and dif-

ferences. (*g*) Salt, water, oyl, and earth ſeem to be originally the ſame in all vegetables. All the difference, according to the chymiſts, ariſeth from a ſpirit reſiding in the oyl, called the Rector or Archæus. This is otherwiſe called by chymiſts, ens primum, or the native ſpirit, whereon depend, and wherein are contained, the peculiar flavour and odour, the ſpecific qualities and virtues of the plant.

137. These native ſpirits or vegetable ſouls are all breathed or exhaled into the air, which ſeems the receptacle as well as ſource of all ſublunary forms, the great maſs or chaos which imparts and receives them. The air or atmoſphere that ſurrounds our earth contains a mixure of all the active volatile parts of the whole habitable world, that is of all vegetables, minerals and animals. Whatever perſpires, corrupts, or exhales impregnates the air; which, being acted upon by the ſolar fire, produceth within it ſelf all ſorts of chymical operations, diſpenſing again thoſe ſalts and ſpirits in new generations, which it had received from putrefactions.

138. The perpetual oſcillations of this elaſtic and reſtleſs element operate without ceaſing,

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(*g*) 129.

ceaſing, on all things that have life, whether animal or vegetable, keeping their fibres, veſſels, and fluids in a motion always changing; as heat, cold, moiſture, dryneſs, and other cauſes alter the elaſticity of the air. Which accounts, it muſt be owned, for many effects. But there are many more which muſt be derived from other principles or qualities in the air. Thus iron and copper are corroded and gather ruſt in the air, and bodies of all ſorts are diſſolved or corrupted, which ſheweth an acid to abound and diffuſe it ſelf throughout the air.

139. By this ſame air fire is kindled, the lamp of life preſerved, reſpiration, digeſtion, nutrition, the pulſe of the heart and motion of all the muſcles ſeem to be performed. Air therefore is a general agent, not only exerting it's own, but calling forth the qualities or powers of all other bodies, by a diviſion, comminution, and agitation of their particles, cauſing them to fly off and become volatile and active.

140. Nothing ferments, vegetates, or putrefies without air, which operates with all the virtues of the bodies included in it; that is, of all nature; there being no drug, ſalu-

tary or poiſonous, whoſe virtues are not breathed into the air. The air therefore is an active maſs of numberleſs different principles the general ſource of corruption and generation; on one hand dividing, abrading, and carrying off the particles of bodies, that is, corrupting or diſſolving them; on the other, producing new ones into being; deſtroying and beſtowing forms without intermiſſion.

141. The ſeeds of things ſeem to lye latent in the air, ready to appear and produce their kind, whenever they light on a proper matrix. The extremely ſmall ſeeds of fern, moſſes, muſhrooms, and ſome other plants are concealed and waſted about in the air, every part whereof ſeems replete with ſeeds of one kind or other. The whole atmoſphere ſeems alive. There is every where acid to corrode, and ſeed to engender. Iron will ruſt, and mold will grow in all places. Virgin earth becomes fertile, crops of new plants ever and anon ſhew themſelves, all which demonſtrates the air to be a common ſeminary and receptacle of all vivifying principles.

142. Air may alſo be ſaid to be the ſeminary of minerals and metals, as it is of vegetables. Mr. Boyle informs us, that the ex-

hauſted ores of tin and iron being expoſed to the air become again impregnated with metal, and that ore of alum having loſt it's ſalt recovers it after the ſame manner. The like is related of ſilver and iron ores. And numberleſs inſtances there are of ſalts produced by the air, that vaſt collection or treaſury of active principles, from which all ſublunary bodies ſeem to derive their forms, and on which animals depend for their life and breath.

143. THAT there is ſome latent vivifying ſpirit diſperſed throughout the air common experience ſheweth; inaſmuch as it is neceſſary both to vegetables and animals (*b*) whether terreſtrial or aquatic, neither beaſts, inſects, birds nor fiſhes being able to ſubſiſt without air. Nor doth all air ſuffice, there being ſome quality or ingredient, of which when air is deprived, it becometh unfit to maintain either life or flame. And this even though the air ſhould retain it's elaſticity; which, by the bye, is an argument that air doth not act only as an antagoniſt to the intercoſtal muſcles. It hath both that and many other uſes. It gives and preſerves a proper tone to the veſſels: This elaſtic fluid promotes all ſecretions: it's oſcillations keep every part in motion

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(*b*) 138, 139.

tion: it pervades and actuates the whole animal ſyſtem, producing great variety of effects, and even oppoſite in different parts, cooling at the ſame time and heating, diſtending and contracting, coagulating and reſolving, giving and taking, ſuſtaining life and impairing it, preſſing without and expanding within, abrading ſome parts, at the ſame time inſinuating and ſupplying others, producing various vibrations in the fibres, and ferments in the fluids; all which muſt needs enſue from ſuch a ſubtile, active, heterogeneous and elaſtic fluid.

144. BUT there is, as was before obſerved, ſome one quality or ingredient in the air, on which life more immediately and principally depends. What that is, though men are not agreed, yet it is agreed it muſt be the ſame thing that ſupports the vital and the common flame; it being found that when air, by often breathing in it, is become unfit for the one, it will no longer ſerve for the other. The like is obſervable in poiſonous damps or ſteams, wherein flame cannot be kindled. As is evident in the Grotto del cane near Naples. And here it occurs, to recommend the plunging them into cold water, as an experiment to be tried on perſons affected by breathing a poiſonous vapour in old vaults, mines, deep holes

or cavities under ground. Which, I am apt to think, might ſave the lives of ſeveral, by what I have ſeen practiſed on a dog convulſed and in all appearance dead, but inſtantly reviving on being taken out of the abovementioned grotto and thrown into a lake adjacent.

145. Air, the general menſtruum and ſeminary, ſeemeth to be only an aggregate of the volatile parts of all natural beings, which variouſly combined and agitated produce many various effects. Small particles in a near and cloſe ſituation ſtrongly act upon each other, attracting, repelling, vibrating. Hence divers fermentations, and all the variety of meteors, tempeſts, and concuſſions both of earth and firmament. Nor is the microcoſm leſs affected thereby. Being pent up in the viſcera, veſſels, and membranes of the body, by it's ſalts, ſulphurs, and elaſtic power, it engenders cholics, ſpaſms, hyſteric diſorders and other maladies.

146. The ſpecific quality of air is taken to be permanent elaſticity. Mr. Boyle is expreſly of this opinion. And yet, whether there be any ſuch thing as permanently elaſtic air may be doubted, there being many things

which ſeem to rob the air of this quality, or at leaſt leſſen and ſuſpend it's exertion. The ſalts and ſulphurs, for inſtance, that float in the air abate much of it's elaſticity by their attraction.

147. Upon the whole it is manifeſt, that air is no diſtinct element, but a maſs or mixture of things the moſt heterogeneous and even oppoſite to each other (*m*) which become air, by acquiring an elaſticity and volatility from the attraction of ſome active, ſubtile ſubſtance; whether it be called fire, æther, light, or the vital ſpirit of the world; in like manner as the particles of antimony, of themſelves not volatile, are carried off in ſublimation and rendered volatile, by cohering with the particles of ſal ammoniac. But action and reaction being equal, the ſpring of this æthereal ſpirit is diminiſhed by being imparted. It's velocity and ſubtilty are alſo leſs from it's being mixed with groſſer particles. Hence ſound moves ſlower than light, as mud than clear water.

148. Whether air be only freed and fixed, or generated and deſtroyed, it is certain that air begins and ceaſes to exert or ſhew itſelf. Much by experiments ſeems to be generated,

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(*m*) 137, 145.

generated, not only from animals, fruits, and vegetables, but alſo from hard bodies. And it is obſerved by ſir Iſaac Newton, that air produced from hard bodies is moſt elaſtic. The tranſmutation of elements, each into other, hath been anciently held. In Plutarch we find it was the opinion of Heraclitus, that the death of fire was a birth to air, and the death of air a birth to water. This opinion is alſo maintained by ſir Iſaac Newton. Though it may be queſtioned, whether what is thought a change be not only a diſguiſe.

149. Fire ſeems the moſt elaſtic and expanſive of all bodies. It communicates this quality to moiſt vapours and dry exhalations, when it heats and agitates their parts, cohering cloſely with them, overcoming their former mutual attraction, and cauſing them, inſtead thereof, reciprocally to repell each other and fly aſunder, with a force proportionable to that wherewith they had cohered.

150. Therefore in air we may conceive two parts, the one more groſs which was raiſed and carried off from the bodies of this terraqueous maſs: the other a fine ſubtile ſpirit by means whereof, the former is rendered volatile and elaſtic. Together they compoſe a

medium, whoſe elaſticity is leſs than that of pure æther, fire, or ſpirit, in proportion to the quantity of ſalts, vapours, and heterogeneous particles contained therein. Hence it follows, that there is no ſuch thing as a pure ſimple element of air. It follows alſo that on the higheſt mountains, air ſhould be more rare than in proportion to the vulgar rule, of the ſpaces being reciprocally as the preſſures: and ſo in fact it is ſaid to have been found, by the Gentlemen of the French Academy of Sciences.

151. ÆTHER, fire, or ſpirit being attracted and clogged by heterogeneous particles becometh leſs active; and the particles cohering with thoſe of æther, become more active than before. Air therefore is a maſs of various particles, abraded and ſublimated from wet and dry bodies of all ſorts, cohering with particles of æther; the whole permeated by pure æther, or light, or fire: for theſe words are uſed promiſcuouſly by ancient philoſophers.

152. THIS æther or pure inviſible fire, the moſt ſubtile and elaſtic of all bodies, ſeems to pervade and expand it ſelf throughout the whole univerſe. If air be the immediate

agent or inſtrument in natural things, it is the pure inviſible fire that is the firſt natural mover or ſpring, from whence the air derives it's power (*a*). This mighty agent is every where at hand, ready to break forth into action, if not reſtrained and governed with the greateſt wiſdom. Being always reſtleſs and in motion, it actuates and enlivens the whole viſible maſs, is equally fitted to produce and to deſtroy, diſtinguiſhes the various ſtages of nature, and keeps up the perpetual round of generations and corruptions, pregnant with forms which it conſtantly ſends forth and reſorbs. So quick in it's motions, ſo ſubtile and penetrating in it's nature, ſo extenſive in it's effects, it ſeemeth no other than the vegetative ſoul or vital ſpirit of the world.

153. THE animal ſpirit in man is the inſtrumental or phyſical cauſe both of ſenſe and motion. To ſuppoſe ſenſe in the world, would be groſs and unwarranted. But locomotive faculties are evident in all it's parts. The Pythagoreans, Platoniſts, and Stoics held the world to be an animal. Though ſome of them have choſen to conſider it as a vegetable. However the phænomena and effects do plainly ſhew there is a ſpirit that moves, and a

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(*a*) 139, 149, 151.

a mind or providence that preſides. This providence, Plutarch ſaith, was thought to be in regard to the world, what the ſoul is in regard to man.

154. The order and courſe of things, and the experiments we daily make, ſhew there is a mind that governs and actuates this mundane ſyſtem, as the proper real agent and cauſe. And that the inferior inſtrumental cauſe is pure æther, fire, or the ſubſtance of light (*c*) which is applied and determined by an infinite mind in the macrocoſm or univerſe, with unlimited power, and according to ſtated rules; as it is in the microcoſm, with limited power and skill by the humane mind. We have no proof, either from experiment or reaſon, of any other agent or efficient cauſe than mind or ſpirit. When therefore we ſpeak of corporeal agents or corporeal cauſes, this is to be underſtood in a different, ſubordinate, and improper ſenſe.

155. The principles whereof a thing is compounded, the inſtrument uſed in it's production, and the end for which it was intended, are all in vulgar uſe termed cauſes, though none of them be ſtrictly ſpeaking agent

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(*c*) 29, 37, 136, 149.

agent or efficient. There is not any proof that an extended corporeal or mechanical cauſe doth really and properly act, even motion it ſelf being in truth a paſſion. Therefore though we ſpeak of this fiery ſubſtance as acting, yet it is to be underſtood only as a mean or inſtrument, which indeed is the caſe of all mechanical cauſes whatſoever. They are nevertheleſs ſometimes termed agents and cauſes, although they are by no means active in a ſtrict and proper ſignification. When, therefore, force, power, virtue, or action are mentioned as ſubſiſting in an extended and corporeal or mechanical being, this is not to be taken in a true genuine and real, but only in a groſs and popular ſenſe, which ſticks in appearances, and doth not analyſe things to their firſt principles. In compliance with eſtabliſhed language and the uſe of the world, we muſt employ the popular current phraſe. But then in regard to truth we ought to diſtinguiſh it's meaning. It may ſuffice to have made this declaration once for all, in order to avoid miſtakes.

156. The calidum innatum, the vital flame, or animal ſpirit in man is ſuppoſed the cauſe of all motions, in the ſeveral parts of his body, whether voluntary or natural. That

it is the inſtrument, by means whereof the mind exerts and manifeſts her ſelf in the motions of the body. In the ſame ſenſe may not fire be ſaid to have force, to operate, and agitate the whole ſyſtem of the world, which is held together and informed by one preſiding mind, and animated throughout by one and the ſame fiery ſubſtance, as an inſtrumental and mechanical agent, not as a primary real efficient?

157. THIS pure ſpirit or inviſible fire is ever ready to exert and ſhew it ſelf in it's effects, (*d*) cheriſhing, heating, fermenting, diſſolving, ſhining and operating in various manners, where a ſubject offers to employ or determine it's force. It is preſent in all parts of the earth and firmament, though perhaps latent and unobſerved, till ſome accident produceth it into act, and renders it viſible in it's effects.

158. THERE is no effect in nature, great, marvellous, or terrible but proceeds from fire, that diffuſed and active principle, which at the ſame time that it ſhakes the earth and heavens, will enter, divide, and diſſolve the ſmalleſt, cloſeſt, and moſt compacted bodies.

(*d*) 152.

In remote cavities of the earth it remains quiet, till perhaps an accidental ſpark from the colliſion of one ſtone againſt another kindles an exhalation, that gives birth to an earthquake or tempeſt, which ſplits mountains or overturns cities. This ſame fire ſtands unſeen in the focus of a burning glaſs, till ſubjects for it to act upon come in it's way, when it is found to melt, calcine, or vitrify the hardeſt bodies.

159. No eye could ever hitherto diſcern, and no ſenſe perceive, the animal ſpirit in a human body, orherwiſe than from it's effects. The ſame may be ſaid of pure fire, or the ſpirit of the univerſe, which is perceived only by means of ſome other bodies, on which it operates or with which it is joined. What the Chymiſts ſay, of pure acid's being never found alone, might as well be ſaid of pure fire.

160. The mind of man acts by an inſtrument neceſſarily. The το ἡγεμονικὸν, or mind preſiding in the world, acts by an inſtrument freely. Without inſtrumental and ſecond cauſes, there could be no regular courſe of Nature. And without a regular courſe, nature could never be underſtood. Mankind muſt always

be at a loſs, not knowing what to expect, or how to govern themſelves, or direct their actions for the obtaining of any end. Therefore in the government of the world phyſical agents, improperly ſo called, or mechanical, or ſecond cauſes, or natural cauſes, or inſtruments, are neceſſary to aſſiſt, not the Governor, but the governed.

161. In the humane body the mind orders and moves the limbs: but the animal ſpirit is ſuppoſed the immediate phyſical cauſe of their motion. So likewiſe in the mundane ſyſtem, a mind preſides, but the immediate, mechanical, or inſtrumental cauſe, that moves or animates all it's parts, is the pure elementary fire or ſpirit of the world. The more fine and ſubtile part or ſpirit is ſuppoſed to receive the impreſſions of the firſt mover, and communicate them to the groſſer ſenſible parts of this world. Motion, though in metaphyſical rigour and truth a paſſion or mere effect, yet, in phyſics paſſeth for an action. And by this action all effects are ſuppoſed to be produced. Hence the various communications, determinations, accelerations of motion conſtitute the laws of nature.

162. The pure æther or inviſible fire contains parts of different kinds, that are impreſſed with different forces, or ſubjected to different laws of motion, attraction, repulſion and expanſion, and endued with divers diſtinct habitudes towards other bodies. Theſe ſeem to conſtitute the many various qualities, (*e*) virtues, flavours, odours, and colours, which diſtinguiſh natural productions. The different modes of cohæſion, attraction, repulſion and motion, appear to be the ſource from whence the ſpecific properties are derived, rather than different ſhapes or figures. This as hath been already obſerved, ſeems confirmed by the experiment of fixed ſalts operating one way, notwithſtanding the difference of their angles. The original particles productive of odours, flavours, and other properties, as well as of colours, are, one may ſuſpect, all contained and blended together in that univerſal and original ſeminary of pure elementary fire; from which they are diverſly ſeparated and attracted, by the various ſubjects of the animal, vegetable, and mineral kingdoms; which thereby become claſſed into kinds, and endued with thoſe diſtinct properties, which continue till their

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(*e*) 37, 40, 4.

their ſeveral forms, or ſpecific proportions of fire return into the common maſs.

163. As the ſoul acts immediately on pure fire, ſo pure fire operates immediately on air. that is, the abraſions of all terreſtrial things being rendered volatile and elaſtic by fire, (*f*) and at the ſame time leſſening the volatility and expanſive force of the fire, whoſe particles they attract and adhære to (*k*), there is produced a new fluid, more volatile than water or earth, and more fixed than fire. Therefore the virtues and operations imputed to air, muſt be ultimately attributed to fire, as that which imparts activity to air it ſelf.

164. The element of ætherial fire or light ſeems to comprehend, in a mixed ſtate, the ſeeds, the natural cauſes and forms (*g*) of all ſublunary things. The groſſer bodies do ſeparate, attract, and repell the ſeveral conſtituent particles of that heterogeneous element; which being parted from the common maſs, make diſtinct eſſences, producing and combining together ſuch qualities and properties, as are peculiar to the ſeveral ſubjects, and thence often extracted in eſſential oyls or odoriferous waters, from whence they exhale into the

(*f*) 149, 150, 152. (*k*) 147. (*g*) 43.

the open air, and return into their original element.

165. Blue, red, yellow, and other colours, have been diſcovered by Sir Iſaac Newton to depend on the parted raies or particles of light. And in like manner, a particular odour or flavour, ſeemeth to depend on peculiar particles of light or fire (*h*); as appears from heats being neceſſary to all vegetation whatſoever, and from the extreme minuteneſs and volatility of thoſe vegetable ſouls or forms, flying off from the ſubjects without any ſenſible diminution of their weight. Theſe particles blended in one common ocean, ſhould ſeem to conceal the diſtinct forms, but, parted and attracted by proper ſubjects, diſcloſe or produce them. As the particles of light which when ſeparated, form diſtinct colours, being blended are loſt in one uniform appearance.

166. Agreeably thereto, an ætherial ſubſtance or fire was ſuppoſed by Heraclitus to be the ſeed of the generation of all things, or that from which all things drew their original. The Stoics alſo taught, that all ſubſtance was originally fire, and ſhould return to fire: that an active ſubtile fire was diffuſed or expanded throughout

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(*h*) 40.

throughout the whole univerſe; the ſeveral parts whereof were produced, ſuſtained, and held together by it's force. And it was the opinion of the Pythagoræans, as Laertius informs us, that Heat or Fire was the principle of Life animating the whole ſyſtem, and penetrating all the elements (*a*). The Platoniſts too, as well as the Pythagoræans, held fire to be the immediate natural agent, or animal ſpirit; to cheriſh, to warm, to heat, to enlighten, to vegetate, to produce the digeſtions, circulations, ſecretions, and organical motions in all living bodies, vegetable or animal, being effects of that element, which, as it actuates the macrocoſm, ſo it animates the microcoſm. In the Timæus of Plato, there is ſuppoſed ſomething like a net of fire, and raies of fire in a humane body. Doth not this ſeem to mean the animal ſpirit, flowing, or rather darting through the nerves?

167. ACCORDING to the Peripatetics, the form of heaven, or the fiery æthereal ſubſtance, contains the forms of all inferior beings. (*e*) It may be ſaid to teem with forms, and impart them to ſubjects fitted to receive them. The vital force thereof in the Peripatetic ſence is vital to all, but diverſly received according

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(*a*) 152, 153. (*e*) 43.

according to the diverſity of the ſubjects. So all colours are virtually contained in the light; but their actual diſtinctions of blue, red, yellow, and the reſt, depend on the difference of the objects which it illuſtrates. Ariſtotle in the book de mundo, ſuppoſeth a certain fifth eſſence, an ætherial nature unchangeable and impaſſive; and next in order a ſubtile, flaming ſubſtance, lighted up, or ſet on fire by that ætherial and divine nature. He ſuppoſeth, indeed, that God is in heaven, but that his power, or a force derived from him, doth actuate and pervade the univerſe.

168. If we may credit Plutarch, Empedocles thought æther or heat to be Jupiter. Æther by the ancient philoſophers was uſed to ſignify promiſcuouſly ſometimes fire and ſometimes air. For they diſtinguiſhed two ſorts of air. Plato in the Timæus ſpeaking of air ſaith there are two kinds, the one more fine and ſubtile, called æther, the other more groſs and replete with vapours! This æther or purer medium ſeems to have been the air or principle, from which all things according to Anaximenes derived their birth, and into which they were back again reſolved at their death. Hippocrates in his treatiſe de diæta,

ſpeaketh of a fire pure and inviſible; and this fire, according to him, is that which ſtirring and giving movement to all things cauſes them to appear or, as he ſtyles it, come into evidence, that is to exiſt, every one in it's time and according to it's deſtiny.

169. THIS pure fire, æther, or ſubſtance of light, was accounted in it ſelf inviſible and imperceptible to all our ſenſes, being perceived only by it's effects ſuch as heat, flame, and rarefaction. To which we may add, that the moderns pretend farther to have perceived it by weight, inaſmuch as the aromatic oyls which moſt abound with fire, as being the moſt readily and vehemently enflamed, are above all others the heavieſt. And by an experiment of Mr. Homberg's, four ounces of regulus of antimony, being calcined by a burning glaſs for an hour together, were found to have imbibed and fixed ſeven drams of the ſubſtance of light.

170. SUCH is the rarefying and expanſive force of this element, as to produce in an inſtant of time the greateſt and moſt ſtupendous effects: a ſufficient proof not only of the power of fire, but alſo of the wiſdom with which it is managed, and witheld from burſt-

ing forth every moment to the utter ravage and deſtruction of all things. And it is very remarkable, that this ſame element, ſo fierce and deſtructive, ſhould yet be ſo variouſly tempered and applied, as to be withal the ſalutary warmth, the genial, cheriſhing, and vital flame of all living creatures. It is not therefore to be wondered that Ariſtotle thought, the heat of a living body to be ſomewhat divine and cæleſtial, derived from that pure æther to which he ſuppoſed the incorporeal deity (χωριστὸν εἶδος) to be immediately united, or on which he ſuppoſed it immediately to act.

171. The Platoniſts held that intellect reſided in ſoul, and ſoul in an æthereal vehicle. And that as the ſoul was a middle nature reconciling Intellect with Æther; ſo Æther was another middle nature, which reconciled and connected the ſoul with groſſer bodies (*d*). Galen likewiſe taught that, admitting the ſoul to be incorporeal, it hath for it's immediate tegument or vehicle a body of æther or fire, by the intervention whereof it moveth other bodies and is mutually affected by them. This interior cloathing was ſuppoſed to remain upon the ſoul, not only after death, but after the moſt perfect purgation, which in

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(*d*) 152, 154.

length of time according to the followers of Plato and Pythagoras cleanſed the ſoul,

——— purumque reliquit
Æthereum ſenſum atque auräi ſimplicis ignem.

This tunicle of the ſoul, whether it be called pure æther, or luciform vehicle, or animal ſpirit ſeemeth to be that which moves and acts upon the groſs organs, as it is determined by the ſoul from which it immediately receives impreſſion, and in which the moving force truly and properly reſides. Some moderns have thought fit to deride all that is ſaid of æthereal vehicles, as mere jargon or words without a meaning. But they ſhould have conſidered, that all ſpeech concerning the ſoul is altogether, or for the moſt part, metaphorical; and that, agreeably thereunto, Plato ſpeaketh of the mind or ſoul, as a driver that guides and governs a chariot, which is, not unfitly, ſtyled ’αυγοειδὲς a luciform æthereal vehicle or ὄχημα, terms expreſſive of the purity, lightneſs, ſubtilty and mobility of that fine cæleſtial nature, in which the ſoul immediately reſides and operates.

172. It was a tenet of the Stoics that the world was an animal, and that providence anſwered to the reaſonable ſoul in man. But then the providence or mind was ſuppoſed

by them, to be immediately reſident or preſent in fire, to dwell therein, and to act thereby. Briefly, they conceived God to be an intellectual and fiery ſpirit, πνεῦμα νοερὸν Καὶ πυρῶδες. Therefore though they looked on fire (*f*) as the τὸ ἡγεμονικὸν or governing principle of the world; yet it was not ſimply fire, but animated with a mind,

173. Such are the bright and lively ſignatures of a divine mind, operating and diſplaying it ſelf in fire and light throughout the world, that, as Ariſtotle obſerves in his book de mnndo, all things ſeem full of divinities, whoſe apparitions on all ſides ſtrike and dazzle our eyes. And it muſt be owned, the chief philoſophers and wiſe men of antiquity, how much ſoever they attributed to ſecond cauſes and the force of fire, yet they ſuppoſed a mind or intellect always reſident therein, active or provident, reſtraining it's force and directing it's operations.

174. Thus Hippocrates in his treatiſe, de diæta, ſpeaks of a ſtrong but inviſible fire (*g*), that rules all things without noiſe. Herein, ſaith he, reſides ſoul, underſtanding, prudence, growth, motion, diminution, change, ſleep and

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(*f*) 166. (*g*) 168.

and waking. This is what governs all things, and is never in repoſe. And the ſame author, in his tract, de carnibus, after a ſerious preface ſetting forth that he is about to declare his own opinion, expreſſeth it in theſe terms. That which we call heat θερμὸν appears to me ſomething immortal, which underſtands all things, which ſees and knows both what is preſent and what is to come.

175. THIS ſame heat is alſo what Hippocrates calls nature, the author of life and death, good and evil. It is farther to be noted of this heat, that he maketh it the object of no ſenſe. It is that occult, univerſal nature, and inward inviſible force, which actuates and animates the whole world, and was worſhip'd by the ancients under the name of Saturn; which Voſſius judges not improbably to be derived from the Hebrew word Satar, to lye hidden or concealed. And what hath been delivered by Hippocrates, agrees with the notions of other philoſophers: Heraclitus, (*h*) for inſtance, who held fire to be the principle and cauſe of the generation of all things, did not mean thereby an inanimate element, but, as he termed it, πυρ ἀείζωον, an everliving fire.

176. THEO-

(*h*) 166.

176. Theophraſtus, in his book, *de igne*, diſtinguiſheth between heat and fire. The firſt he conſiders as a principle or cauſe, not that which appeareth to ſenſe as a paſſion or accident exiſting in a ſubject, and which is in truth the effect of that unſeen principle. And it is remarkable, that he refers the treating of this inviſible fire or heat, to the inveſtigation of the firſt cauſes. Fire, the principle, is neither generated nor deſtroyed, is every where and always preſent (*a*): while it's effects in different times and places ſhew themſelves more or leſs, and are very various, ſoft and cheriſhing, or violent and deſtructive, terrible or agreeable, conveying good and evil, growth and decay, life and death, throughout the mundane ſyſtem.

177. It is allowed by all, that the Greeks derived much of their philoſophy from the Eaſtern nations. And Heraclitus is thought by ſome to have drawn his principles from Orpheus, as Orpheus did from the Ægyptians; or, as others write, he had been auditor of Hippaſus a Pythagorean, who held the ſame notion of fire, and might have derived it from Ægypt by his maſter Pythagoras, who had travelled

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(*a*) 157.

travelled into Ægypt, and been inſtructed by the Sages of that nation. One of whoſe tenets it was, that fire was the principle of all action; which is agreeable to the doctrine of the Stoics, that the whole of things is adminiſtred by a fiery intellectual Spirit. In the Aſclepian Dialogue, we find this notion, that all parts of the world vegetate by a fine ſubtil æther, which acts as an engine or inſtrument, ſubject to the will of the ſupreme God.

178. As the Platoniſts held intellect to be lodged in ſoul, and ſoul in æther (*b*); ſo it paſſeth for a doctrine of Triſmegiſtus in the Pimander, that mind is cloathed by ſoul, and ſoul by ſpirit. Therefore as the animal ſpirit of man, being ſubtil and luminous, is the immediate tegument of the human ſoul, or that wherein and whereby ſhe acts; even ſo the ſpirit of the World, that active fiery æthereal ſubſtance of Light, that permeates and animates the whole ſyſtem, is ſuppoſed to cloath the ſoul, which cloaths the mind of the univerſe.

179. THE Magi likewiſe ſaid of God, that he had light for his body and truth for his ſoul. And in the Chaldaic oracles, all things are

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(*b*) 171.

are ſuppoſed to be governed by a πῦρ νοερὸν or intellectual fire. And in the ſame oracles, the creative mind is ſaid to be cloathed with fire. ἑσσαμένος πυρὶ πῦρ which oriental reduplication of the word fire ſeems to imply the extreme purity and force thereof. Thus alſo in the Pſalms, Thou art clothed with light as with a garment. Where, the word rendered light might have been render'd fire, the Hebrew letters being the ſame with thoſe in the word which ſignifies fire, all the difference being in the pointing, which is juſtly counted a late invention. That other ſcripture ſentence is remarkable: who maketh his miniſters a flaming fire: which might, perhaps, be rendered more agreeably to the context, as well as conſiſtently with the Hebrew, after this manner: who maketh flaming fire his miniſters: and the whole might run thus: who maketh the winds his meſſengers, and flaming fire his miniſters.

180. A NOTION of ſomething divine in Fire, animating the whole world, and ordering it's ſeveral parts, was a tenet of very general extent (*c*), being embraced in the moſt

diſtant

(*c*) 156, 157, 163, 166, 167, 158, 170, 172, 173, 174, 175, 177, &c.

diſtant times and places, even among the Chineſe themſelves; who make tien, æther, or heaven, the ſovereign principle or cauſe of all things, and teach that the cæleſtial virtue, by them called li, when joined to corporeal ſubſtance, doth faſhion, diſtinguiſh, and ſpecificate all natural beings. This li of the Chineſe ſeems to anſwer the forms of the Peripatetics. And both bear analogy to the foregoing philoſophy of Fire.

181. The Heaven is ſuppoſed pregnant with virtues and forms, which conſtitute and diſcriminate the various ſpecies of things. And we have more than once obſerved, that, as the light, fire, or cæleſtial æther, being parted by refracting or reflecting bodies, produceth variety of colours; even ſo, that ſame apparently uniform ſubſtance being parted and ſecreted by the attracting and repelling powers of the divers ſecretory ducts of plants and animals, that is, by natural chymiſtry, produceth or imparteth the various ſpecific properties of natural bodies. Whence the taſtes and odours and medicinal virtues ſo various in vegetables.

182. The tien is conſidered and adored by the learned Chineſe, as living and intelligent æther, the πῦρ νοερὸν of the Chaldæans and the Stoics. And the worſhip of things cæleſtial, the Sun and Stars, among the Eaſtern nations leſs remote, was on account of their fiery nature, their heat and light, and the influence thereof. Upon theſe accounts, the Sun was looked on by the Greek Theologers as the ſpirit of the world, and the power of the world. The cleanſing quality, the light and heat of fire are natural ſymbols of purity, knowledge, and power, or, if I may ſo ſay, the things themſelves ſo far as they are perceptible to our ſenſes, or in the ſame ſenſe as motion is ſaid to be action. Accordingly, we find a religious regard was paid to fire, both by Greeks and Romans, and indeed by moſt, if not all, the nations of the world.

183. The worſhip of Veſta at Rome was, in truth, the worſhip of Fire.

Nec tu aliud Veſtam quam vivam intellige flammam,

Saith Ovid in his Faſti. And as in old Rome the eternal Fire was religiouſly kept by virgins, ſo in Greece, particularly at Delphi and Athens, it was kept by widows. It is well known that Vulcan or Fire was worſhiped with great diſtinction by the Ægyptians. The Zabii or Sabeans are alſo known to have been worſhipers of Fire. It appears too from the Chaldean oracles, that Fire was regarded as divine by the ſages of that nation. And it is ſuppoſed that Ur of the Chaldæans was ſo called from the Hebrew word ſignifying fire, becauſe fire was publickly worſhiped in that city. That a religious worſhip was paid to fire by the ancient Perſians and their Magi, is atteſted by all antiquity. And the ſect of Perſées, or old Gentils, of whom there are conſiderable remains at this day both in the Mogols country and in Perſia, doth teſtify the ſame.

184. It doth not ſeem that their proſtrations before the perpetual fires, preſerved with great care in their Pyreia, or fire temples, were merely a civil reſpect, as Dr. Hyde would have it thought. Although he brings good proof that they do not invoke the fire on their altars, or pray to it, or call it God: and that they acknowledge a ſupreme inviſible deity. Civil reſpects are paid to things as related to civil power: but ſuch relation doth nor appear in the preſent caſe. It ſhou'd ſeem therefore, that they worſhip God

as preſent in the fire, which they worſhip or reverence, not ultimately or for it ſelf, but relatively to the ſupreme being. Which it is not unlikely was elſewhere the caſe at firſt; though the practice of men, eſpecially of the vulgar, might in length of time degenerate from the original inſtitution, and reſt in the object of ſenſe.

185. DOCTOR HYDE, in his hiſtory of the religion of the ancient Perſians, would have it thought, that they borrowed the uſe and reverence of perpetual fires, from the Jewiſh practice preſcribed in the Levitical law, of keeping a perpetual fire burning on the altar. Whether that was the caſe or not, thus much one may venture to ſay, it ſeems probable that whatever was the original of this cuſtom among the Perſians, the like cuſtoms among the Greeks and Romans were derived from the ſame ſource.

186. IT muſt be owned there are many paſſages in holy ſcripture (*d*), that would make one think, the ſupreme being was in a peculiar manner preſent and maniſeſt in the element of fire. Not to inſiſt that God is more than once ſaid to be a conſuming fire, which might be

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(*d*) 179.

be underſtood in a metaphorical ſenſe, the divine apparitions were by fire, in the buſh, at mount Sinai, on the tabernacle, in the cloven tongues. God is repreſented in the inſpired writings, as deſcending in fire, as attended by fire, or with fire going before him. Cæleſtial things as Angels, chariots, and ſuch like phænomena are inveſted with fire, light, and ſplendor. Ezekiel in his viſions beheld fire and brightneſs, lamps, burning coals of fire, and flaſhes of lightening. In a viſion of Daniel the throne of God appeared like a fiery flame, and his wheels like burning fire. Alſo a fiery flame iſſued and came forth from before him.

187. At the transfiguration, the apoſtles ſaw our ſaviour's face ſhining as the ſun, and his raiment white as light, alſo a lucid cloud or body of light, out of which the voice came; which viſible light and ſplendor was, not many centuries ago, maintained by the Greek church, to have been divine, and uncreated, and the very glory of God: as may be ſeen in the hiſtory wrote by the Emperor John Cantacuzene. And of late years Biſhop Patrick gives it as his opinion, that in the beginning of the world, the Shecinah or divine preſence, which was then frequent and

ordinary, appeared by light or fire. In commenting on that paſſage, where Cain is ſaid to have gone out from the preſence of the Lord, the Biſhop obſerves that If Cain after this turned a downright idolater, as many think, it is very likely he introduced the worſhip of the ſun, as the beſt reſemblance he could find of the glory of the Lord, which was wont to appear in a flaming light. It would be endleſs to enumerate all the paſſages of holy ſcripture, which confirm and illuſtrate this notion, or repreſent the Deity as appearing and operating by fire. The miſconſtruction of which might poſſibly have miſled the Gnoſtics, Baſilidians, and other ancient Heretics into an opinion, that Jeſus Chriſt was the viſible corporeal ſun.

188. We have ſeen, that in the moſt remote ages and countries, the vulgar as well as the learned, the inſtitutions of lawgivers, as well as the reaſonings of philoſophers, have ever conſidered the element of fire in a peculiar light, and treated it with more than common regard, as if it were ſomething of a very ſingular and extraordinary nature. Nor are there wanting authors of principal account among the moderns, who entertain like notions concerning fire, eſpecially among thoſe

who are moſt converſant in that element, and ſhould ſeem beſt acquainted with it.

189. MR. HOMBERG the famous modern chymiſt, who brought that art to ſo great perfection, holds the ſubſtance of light or fire to be the true chymic principle ſulphur, (*e*) and to extend it ſelf throughout the whole univerſe. It is his opinion that this is the only active principle. That mixed with various things it formeth ſeveral ſorts of natural productions With ſalts making oyl, with earth bitumen, with mercury metal. That this principle of ſulphur, fire, or the ſubſtance of light, is in it ſelf imperceptible, and only becomes ſenſible as it is joined with ſome other principle, which ſerves as a vehicle for it. That, although it be the moſt active of all things, yet it is at the ſame time the moſt firm bond and cement to combine and hold the principles together, and give form to the mixed bodies. And, that in the analyſis of bodies it is always loſt, eſcaping the skill of the artiſt, and paſſing through the cloſeſt veſſels.

190. Boerhaave, Niewenty't, and divers other moderns are in the ſame way of thinking. They with the ancients diſtinguiſh

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(*e*) 129.

a pure, elementary, inviſible fire from the culinary, or that which appears in ignited bodies (*f*). This laſt they will not allow to be pure fire. The pure fire is to be diſcerned by it's effects alone; ſuch as heat, dilatation of all ſolid bodies, and rarefaction of fluids, the ſegregating heterogeneous bodies, and congregating thoſe that are homogeneous. That therefore which ſmokes and flames is not pure fire, but that which is collected in the focus of a mirrour or burning glaſs. This fire ſeems the ſource of all the operations in nature: without it nothing either vegetates, or putrefies, lives or moves or ferments, is diſſolved or compounded or altered, throughout this whole natural world in which we ſubſiſt. Were it not for this, the whole wou'd be one great ſtupid inanimate maſs. But this active element is ſuppoſed to be every where, and always preſent, imparting different degrees of life heat and motion, to the various animals vegetables and other natural productions, as well as to the elements themſelves, wherein they are produced and nouriſhed.

191. As water acts upon ſalt, or aqua fortis upon iron, ſo fire diſſolves all other bodies. Fire, air, and water are all three menſtrums: but

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(*f*) 163, 166.

but the two laſt ſeem to derive all their force and activity from the firſt (*g*). And indeed there ſeems to be, originally or ultimately, but one menſtruum in nature, to which all other menſtruums may be reduced. Acid ſalts are a menſtruum, but their force and diſtinct powers are from ſulphur. Conſidered as pure, or in themſelves, they are all of the ſame nature. But, as obtained by diſtillation, they are conſtantly joined with ſome ſulphur, which characterizeth and cannot be ſeparated from them. This is the doctrine of monſieur Homberg. But what is it that characterizeth or differenceth the ſulphurs themſelves? If ſulphur be the ſubſtance of light, as that author will have it, whence is it that animal, vegetable, and metallique ſulphurs impart different qualities to the ſame acid ſalt? Can this be explained upon Homberg's principles? And are we not obliged to ſuppoſe, that light ſeparated by the attracting and repelling powers in the ſtrainers, ducts, and pores of thoſe bodies, doth form ſeveral diſtinct kinds of ſulphur, all which, before ſuch ſeparation, were loſt and blended together, in one common maſs of light or fire ſeemingly homogeneous.

(*g*) 149.

192. In the analyſis of inflammable bodies, the fire or ſulphur is loſt, and the diminution of weight ſheweth the loſs (*b*). Oyl is reſolved into water, earth, and ſalt, none of which is inflammable. But the fire or vinculum which connected thoſe things, and gave the form of oyl, eſcapes from the artiſt. It diſappears but is not deſtroyed. Light or fire impriſoned made part of the compound, gave union to the other parts, and form to the whole. But having eſcaped, it mingles with the general ocean of æther, till being again parted and attracted, it enters and ſpecificates ſome new ſubject, of the animal vegetable, or mineral kingdom. Fire therefore in the ſenſe of Philoſophers is always fire, though not always flame.

193. Solar fire or light, in calcining certain bodies, is obſerved to add to their weight. There is therefore no doubt but light can be fixed, and enter the compoſition of a body. And though it ſhould lye latent for a long time, yet, being ſet free from it's priſon, it ſhall ſtill ſhew it ſelf to be fire. Lead, tin, or regulus of antimony, being expoſed to the fire of a burning glaſs, though they loſe much

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(*b*) 169.

much in ſmoke and ſteam, are nevertheleſs found to be conſiderably increaſed in weight, which proves the introduction of light or fire into their pores. It is alſo obſerved, that urine produceth no phoſphorus, unleſs it be long expoſed to the ſolar light. From all which it may be concluded, that bodies do attract and fix the light, whence it ſhould ſeem, as ſome have obſerved, that fire without burning is an ingredient in many things, as water without wetting.

194. Of this there cannot be a better proof, than the experiment of Monſieur Homberg, who made gold of mercury by introducing light into it's pores, but at ſuch trouble and expence, that I ſuppoſe no body will try the experiment for profit. By this junction of light and mercury, both bodies became fixed and produced a third different from either, to wit, real gold. For the truth of which fact, I refer to the memoirs of the French academy of Sciences. From the foregoing experiment it appears, that Gold is only a maſs of Mercury penetrated and cemented by the ſubſtance of light, the particles of thoſe bodies attracting and fixing each other. This ſeems to have been not altogether unknown to former Philoſophers, Marſilius Ficinus the Platoniſt, in

his commentary on the firſt book of the ſecond Ennead of Plotinus, And others likewiſe before him, regarding Mercury as the Mother, and Sulphur as the father of Metals; and Plato himſelf in his Timæus deſcribing gold, to be a denſe fluid with a ſhining yellow light, which well ſuits a compoſition of light and Mercury.

195. Fire or light mixeth with all bodies, (*a*) even with water; witneſs the flaſhing lights in the Sea, whoſe waves ſeem frequently all on fire. It's operations are various according to it's kind, quantity, and degree of vehemence. One degree keeps water fluid, another turns it into elaſtic air (*b*). And air it ſelf ſeems to be nothing elſe but vapours and exhalations, rendered elaſtic by fire. Nothing flames but oyl: and ſulphur with water, ſalt, and earth compoſe oyl; which ſulphur is fire: therefore fire encloſed attracts fire, and cauſeth the bodies whoſe compoſition it enters to burn and blaze.

196. Fire collected in the focus of a glaſs operates in vacuo, and therefore is thought not to need air to ſupport it. Calx of lead hath gone off with an exploſion in vacuo, which

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(*a*) 157. (*b*) 149.

which Niewenty't and others take ſor a proof that fire can burn without air. But Mr. Hales attributes this effect to air encloſed in the red lead, and perhaps too in the receiver, which cannot be perfectly exhauſted. When common lead is put into the fire in order to make red-lead, a greater weight of this comes out than was put in of common lead. Therefore the red-lead ſhou'd ſeem impregnated with fire. Mr. Hales thinks it is with air. The vaſt expanſion of compound aqua fortis, Mr. Niewenty't will have to proceed from fire alone. Mr. Hales contends that air muſt neceſſarily cooperate. Though by Niewenty't's experiment it ſhould ſeem, the phoſporus burns equally, with and without air.

197. Perhaps they who hold the oppoſite ſides in this queſtion, may be reconciled by obſerving that air is in reality nothing more than particles of wet and dry bodies volatiliſed and rendered elaſtic by fire (c). Whatever, therefore, is done by air muſt be aſcribed to fire, which Fire is a ſubtile inviſible thing, whoſe operation is not to be diſcerned but by means of ſome groſſer body, which ſerves not for a pabulum to nouriſh the fire, but for a vehicle to arreſt and bring it into view.

(c) 147, 150, 151.

Which ſeems the ſole uſe of oyl, air, or any other thing, that vulgarly paſſeth for a pabulum or food of that element.

198. To explain this matter more clearly, it is to be obſerved, that fire, in order to become ſenſible, muſt have ſome ſubject to act upon. This being penetrated and agitated by fire affects us with light, heat, or ſome other ſenſible alteration. And this ſubject ſo wrought upon may be called culinary fire. In the focus of a burning glaſs expoſed to the ſun, there is real actual fire, though not diſcerned by the ſenſe, till it hath ſomewhat to work on, and can ſhew it ſelf in it's effects, heating, flaming, melting and the like. Every ignited body is, in the foregoing ſenſe, culinary fire. But it will not therefore follow, that it is convertible into pure elementary fire. This, for ought that appears, may be ingenerable and incorruptible by the courſe of nature. It may be fixed and impriſoned in a compound (*d*), and yet retain it's nature, though loſt to ſenſe, and though it return into the inviſible elementary maſs, upon the analyſis of the compounded body: as is manifeſt in the ſolution of ſtone lime by water.

199. It

(*d*) 159, 192, 193.

199. It ſhould ſeem, therefore, that what is ſaid of air's being the pabulum of fire, or being converted into fire, ought to be underſtood only in this ſenſe; to wit, that air being leſs groſs than other bodies, is of a middle nature, and therefore more fit to receive the impreſſions of a fine ætherial fire (*e*), and impart them to other things. According to the antients, ſoul ſerveth for a vehicle to intellect (*f*), and light or fire for a vehicle to the ſoul; and, in like manner, air may be ſuppoſed a vehicle to fire, fixing it in ſome degree, and communicating it's effects to other bodies.

200. The pure inviſible fire or æther doth permeate all bodies, even the hardeſt and moſt ſolid as the diamond. This alone, therefore, cannot as ſome learned men have ſuppoſed, be the cauſe of muſcular motion, by a mere impulſe of the nerves communicated from the brain to the membranes of the muſcles, and thereby to the encloſed æther, whoſe expanſive motion, being by that means increaſed, is thought to ſwell the muſcles and cauſe a contraction of the fleſhy fibres. This it ſhou'd ſeem, the pure æther cannot do immediately, and of it ſelf,

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(*e*) 163. (*f*) 178.

ſelf, becauſe, ſuppoſing it's expanſive motion to be increaſed, it muſt ſtill paſs through the membranes, and conſequently not ſwell them, inaſmuch as æther is ſuppoſed freely to pervade the moſt ſolid bodies. It ſhould ſeem therefore that this effect muſt be owing, not to pure æther, but to æther in ſome part fixed and arreſted by the particles of air.

201. ALTHOUGH this æther be extremely elaſtic, yet, as it is ſometimes found by experience to be attracted impriſoned and detained in groſs bodies (*g*), ſo we may ſuppoſe it to be attracted, and it's expanſive force diminiſhed, though it ſhould not be quite fixed, by the looſe particles of air, which combining and cohering therewith may bring it down, and qualify it for intercourſe with groſſer things. Pure fire may be ſaid to animate air, and air other things. Pure fire is inviſible; therefore flame is not pure fire. Air is neceſſary both to life and flame. And it is found by experiment, that air loſeth in the lungs the power of feeding flame. Hence it is concluded, that the ſame thing in air contributes both to life and flame. Vital flame ſurvives culinary flame in vacuo: therefore it requires leſs of that thing to ſuſtain it.

202. WHAT

(*g*) 169.

202. WHAT this may be, whether ſome certain proportion, or ſome peculiar parts of æther, is not eaſy to ſay. But thus much ſeems plain, that whatever is aſcribed to acid may be alſo aſcribed to fire or æther. The particles of æther fly aſunder with the greateſt force: therefore, agreeably to ſir Iſaac Newton's doctrine, when united they muſt attract each other with the greateſt force. Therefore they conſtitute the acid. For whatſoever ſtrongly attracts and is attracted, may be called an acid, as ſir Iſaac Newton informs us in his tract de acido. Hence it ſhould ſeem, that the ſulphur of Homberg and the acid of ſir Iſaac are at bottom one and the ſame thing, to wit, pure fire or æther.

203. THE vital flame or æthereal ſpirit, being attracted and impriſoned in groſſer bodies, ſeemeth to be ſet free and carried off, by the ſuperior attraction of a ſubtil and pure flame. Hence, perhaps it is, that lightening kills animals, and turns ſpirituous liquors vapid in an inſtant.

204. HIPPOCRATES in his book concerning the Heart obſerveth, that the ſoul of man is not nouriſhed by meats and drinks from the

lower belly, but by a pure and luminous ſubſtance darting it's raies, and diſtributing a non natural nouriſhment, as he terms it, in like manner as that from the inteſtines is diſtributed to all parts of the body. This luminous non-natural nouriſhment, though it be ſecreted from the blood, is expreſly ſaid not to come from the lower belly. It is plain, therefore, he thought it came into the blood either by reſpiration, or by attraction through the pores. And it muſt be acknowledged, that ſomewhat igneous or æthereal brought by the air into the blood ſeems to nouriſh, though not the ſoul it ſelf, yet the interiour tunicle of the ſoul, the auraï ſimplicis ignem.

205. THAT there is really ſuch a thing as vital flame, actually kindled, nouriſhed, and extinguiſhed like common flame, and by the the ſame means, is an opinion of ſome moderns, particularly of Doctor Willis in his tract de ſanguinis accenſione: that it requires conſtant eventilation, through the trachæa and pores of the body, for the diſcharge of a fuliginous and excrementitious vapour: and that this vital flame, being extremely ſubtil, might not be ſeen any more than ſhining flies or ignes fatui by day-light. And yet it hath ſometimes become viſible on divers perſons,

of which there are undoubted inſtances. This is Dr. Willis's notion: and perhaps there may be ſome truth in this, if it be ſo underſtood, as that light or fire might indeed conſtitute the animal ſpirit or immediate vehicle of the ſoul.

206. There have not been wanting thoſe, who, not content to ſuppoſe light the moſt pure and refined of all corporeal beings, have gone farther, and beſtowed upon it ſome attributes of a yet higher nature. Julianus the Platonic philoſopher, as cited by Ficinus, ſaith it was a doctrine in the theology of the Phænicians, that there is diffuſed throughout the univerſe, a pellucid and ſhining nature pure and impaſſive, the act of a pure intelligence. And Ficinus himſelf undertakes to prove, that light is incorporeal, by ſeveral arguments: Becauſe it enlightens and fills a great ſpace in an inſtant, and without oppoſition: Becauſe ſeveral lights meet without reſiſting each other: Becauſe light cannot be defiled by filth of any kind: Becauſe the ſolar light is not fixed in any ſubject: Laſtly, becauſe it contracts and expands it ſelf ſo eaſily without colliſion, condenſation, rarefaction, or delay throughout the vaſteſt ſpace. Theſe reaſons are given by Ficinus, in his comment

on the firſt book of the ſecond Ennead of Plotinus.

207. BUT it is now well known, that light moves, and that it's motion is not inſtantaneous: that it is capable of condenſation, rarefaction, and colliſion: that it can be mixed with other bodies, enter their compoſition, and increaſe their weight (*h*). All which ſeems ſufficiently to overthrow thoſe arguments of Ficinus, and ſhew light to be corporeal. There appears indeed ſome difficulty at firſt ſight, about the non reſiſtance of raies or particles of light occuring one to another, in all poſſible directions or from all points. Particularly, if we ſuppoſe the hollow ſurface of a large ſphere, ſtudded with eyes looking inwards one at another, it may perhaps ſeem hard to conceive, how diſtinct raies from every eye ſhould arrive at every other eye without juſtling, repelling, and confounding each other.

208. BUT theſe difficulties may be got over by conſidering in the firſt place, that viſible points are not mathematical points, and conſequently that we are not to ſuppoſe every point of ſpace a radiating point. Secondly, by granting

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(*h*) 169, 192, 193.

granting that many raies do reſiſt and intercept each other, notwithſtanding which the act of viſion may be performed. Since as every point of the object is not ſeen, ſo it is not neceſſary that raies from every ſuch point arrive at the eye. We often ſee an object, though more dimly, when many raies are intercepted by a groſs medium.

209. Besides, we may ſuppoſe the particles of light to be indefinitely ſmall, that is as ſmall as we pleaſe, and their aggregate to bear as ſmall a proportion to the void as we pleaſe, there being nothing in this that contradicts the phænomena. And there needs nothing more, in order to conceive the poſſibility of raies paſſing from and to all viſible points, although they be not incorporeal. Suppoſe a hundred ports placed round a circular ſea, and ſhips ſailing from each port to every other; the larger the ſea, and the ſmaller the veſſels are ſuppoſed, the leſs danger will there be of their ſtriking againſt each other. But as there is by hypotheſis no limited proportion between the ſea and the ſhips, the void and ſolid particles of light, ſo there is no difficulty that can oblige us to conclude the ſun's light incorporeal from it's free paſſage; eſpecially when there are ſo many clear

proofs of the contrary. As for the difficulty, therefore, attending the ſuppoſition of a ſphere ſtudded with eyes looking at each other, this is removed only by ſuppoſing the particles of light exceeding ſmall relatively to the empty ſpaces.

210. PLOTINUS ſuppoſeth, that from the ſun's light which is corporeal, there ſprings forth another æquivocal light which is incorporeal, and as it were the brightneſs of the former. Marſilius Ficinus alſo, obſerving it to be a doctrine in the Timæus of Plato that there is an occult fire or ſpirit diffuſed throughout the univerſe, intimates that this ſame occult inviſible fire or light is, as it were, the ſight of the mundane ſoul. And Plotinus in his fourth Ennead ſheweth it to be his opinion, that the world ſeeth it ſelf and all it's parts. The Platonic philoſophers do wonderfully refine upon light, and ſoar very high: from coal to flame; from flame to light: from this viſible light to the occult light of the cœleſtial or mundane ſoul, which they ſuppoſed to pervade and agitate the ſubſtance of the univerſe by it's vigorous and expanſive motion.

211. If we may believe Diogenes Laertius, the Pythagorean philoſophers thought there was a certain pure heat or fire, which had ſomewhat divine in it, by the participation whereof men became allied to the Gods. And according to the Platoniſts, Heaven is not defined ſo much by it's local ſituation, as by it's purity. The pureſt and moſt excellent fire, that is Heaven, ſaith Ficinus. And again, the hidden fire that every where exerts it ſelf, he calls cœleſtial. He repreſents fire as moſt powerful and active, dividing all things, abhorring all compoſition or mixture with other bodies. And, as ſoon as it gets free, relapſing inſtantly into the common maſs of cœleſtial fire, which is every where preſent and latent.

112. This is the general ſource of life, ſpirit, and ſtrength, and, therefore, of health to all animals, who conſtantly receive it's illapſes cloathed in air, through the lungs and pores of the body. The ſame ſpirit impriſoned in food and medicines, is convey'd into the ſtomach, the bowels, the lacteals, circulated and ſecreted by the ſeveral ducts, and diſtributed throughout the ſyſtem (*a*). Plato in his

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(*a*) 37, 42, 44.

his Timæus enumerating the ignited juices, names wine in the firſt place, and tar in the ſecond. But wine is preſſed from the grape, and fermented by humane induſtry. Therefore of all ignited juices purely natural, tar or reſin muſt in his account be eſteemed the firſt.

213. The vivifying luminous æther exiſts in all places, even the darkeſt caverns, as is evident from hence, that many animals ſee in thoſe dark places, and that fire may be kindled in them by the colliſion or attrition of bodies. It is alſo known that certain perſons have fits of ſeeing in the dark. Tiberius was ſaid to have had this faculty or diſtemper. I my ſelf knew an ingenious man who had experienced it ſeveral times in himſelf. And Doctor Willis in his tract de ſanguinis accenſione mentions another of his own knowledge. This luminous æther or ſpirit is therefore ſaid by Virgil, to nouriſh or cheriſh the innermoſt earth, as well as the heavens and cæleſtial bodies.

Principio cælum ac terras, campoſque liquentes.
Lucentemque globum Lunæ, Titaniaque aſtra
Spiritus intus alit.

214. The principles of motion and vegetation in living bodies ſeem to be delibations from the inviſible fire or ſpirit of the univerſe (*b*). Which, though preſent to all things, is not nevertheleſs one way received by all; but variouſly imbibed, attracted, and ſecreted by the fine capillaries, and exquiſite ſtrainers in the bodies of plants and animals, whereby it becomes mixed and detained in their juices.

215. It hath been thought by ſome obſervers of nature, that the fine glandular veſſels admit from the common maſs of the blood, only ſuch juices as are homogeneous to thoſe, with which they were originally imbued. How they came to be ſo imbued doth not appear. But thus much is plain; That fine tubes attract fluids, that the glands are fine tubes, and that they attract very different juices from the common maſs. The ſame holds alſo with regard to the capillary veſſels (*c*) of vegetables, it being evident that through the fine ſtrainers in the leaves and all over the body of the plant, there be juices or fluids of a particular kind drawn in, and ſeparated from the common maſs of air and light. And that

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(*b*) 43, 157, 164, 171. (*c*) 30, 31, 33, 35.

the moſt elaborate ſpirit, whereon the character or diſtinguiſhing virtue and properties of the plant depend, is of a luminous (*d*) and volatile nature, being loſt or eſcaping into air or æther, from eſſential oyls and odoriferous waters, without any ſenſible diminution of the ſubject.

216. As different kinds of ſecreted light or fire produce different eſſences, virtues, or ſpecific properties, ſo alſo different degrees of heat produce different effects. Thus one degree of heat keeps the blood from coagulating, and another degree coagulates the blood. Thus a more violent fire hath been obſerved to ſet free and carry off that very light, which a more moderate fire had introduced and fixed in the calcined regulus of antimony. In like manner, one kind or quantity of this æthereal fiery ſpirit may be congenial and friendly to the ſpirits of a man, while another may be noxious.

217. And experience ſheweth this to be true. For the fermented ſpirit of wine or other liquors produceth irregular motions, and ſubſequent depreſſions in the animal ſpirits. Whereas the luminous ſpirit lodged and detained

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(*d*) 37, 43.

tained in the native balſam of pines and firs, is of a nature ſo mild and benign and proportioned to the humane conſtitution, as to warm without heating, to cheer but not inebriate, and to produce a calm and ſteady joy like the effect of good news, without that ſinking of ſpirits which is a ſubſequent effect of all fermented cordials. I may add, without all other inconvenience, except that it may like any other medicine be taken in too great a quantity for too nice a ſtomach. In which caſe it may be right, to leſſen the doſe, or to take it only once in the four and twenty hours, empty, going to bed (when it is found to be leaſt offenſive,) or even to ſuſpend the taking of it for a time, till nature ſhall ſeem to crave it, and rejoice in it's benign and comfortable ſpirit.

218. Tar water ſerving as a vehicle to this ſpirit is both diuretic and diaphoretic, but ſeems to work it's principal effect by aſſiſting the vis vitæ, as an alterative and cordial, enabling nature by an acceſſion of congenial ſpirit, to aſſimilate that which could not be aſſimilated by her proper force, and ſo to ſubdue the fomes morbi. And this ſhould ſeem in moſt caſes the beſt and ſafeſt courſe. Great evacuations weaken nature as well as the diſeaſe. And it is to be feared that they who

uſe ſalivations and copious bleedings may, though they ſhould recover of the diſtemper, in their whole life be never able to recover of the remedies.

219. It is true indeed, that in chronical caſes there is need of time to compleat a cure, and yet I have known this tar water in diſorders of the lungs and ſtomach to prove a very ſpeedy remedy, and to allay the anxiety and heat of a fever in an inſtant, giving eaſe and ſpirits to the patient. This I have often experienced, not without ſurpriſe at ſeeing theſe ſalutary effects follow ſo immediately in a fever on taking a glaſs of tar water. Such is the force of theſe active vivifying principles contained in this balſam.

220. Force or power, ſtrictly ſpeaking, is the agent alone who imparts an equivocal force to the inviſible elementary fire, or animal ſpirit (*e*) of the world, and this to the ignited body or viſible flame, which produceth the ſenſe of light and heat. In this chain the firſt and laſt links are allowed to be incorporeal: the two intermediate are corporeal, being capable of motion, rarefaction, gravity, and other qualities of bodies. It is fit to diſtinguiſh theſe

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(*e*) 153, 156, 157.

theſe things, in order to avoid ambiguity concerning the nature of fire.

221. Sir Iſaac Newton in his optics, asks; Is not fire a body heated ſo hot as to emit light copiouſly? for what elſe, adds he, is a red hot iron than fire? Now it ſhould ſeem, that to define fire by heat, would be to explain a thing by it ſelf. A body heated ſo hot as to emit light is an ignited body, that is, hath fire in it, is penetrated and agitated by fire, but is not it ſelf fire. And although it ſhould in the third foregoing acceptation, or vulgar ſenſe paſs for fire, yet it is not the pure elementary (*f*) fire in the ſecond or philoſophic ſenſe, ſuch as was underſtood by the Sages of antiquity, and ſuch as is collected in the focus of a burning glaſs; much leſs is it the vis, force, or power of burning, deſtroying, calcining, melting, vitrifying, and raiſing the perceptions of light and heat. This is truly and really in the incorporeal agent, and not in the vital ſpirit of the univerſe. Motion, and even [illegible]wer in an æquivocal ſenſe, may be found in this pure æthereal ſpirit, which ignites bodies, but is not it ſelf the ignited body, being an inſtrument or medium (*g*) by which the real agent doth operate on groſſer bodies.

222. It

(*f*) 190. (*g*) 160.

222. It hath been ſhewed in ſir Iſaac Newton's optics, that light is not reflected by impinging on bodies, but by ſome other cauſe. And to him it ſeems probable, that as many raies as impinge on the ſolid parts of bodies, are not reflected but ſtifled and retained in the bodies. And it is certain, the great poroſity of all known bodies affords room for much of this light or fire to be lodged therein. Gold it ſelf the moſt ſolid of all metals, ſeems to have far more pores than ſolid parts, from water being preſſed through it in the Florentine experiment, from magnetic effluvia paſſing, and from mercury entering it's pores ſo freely. And it is admitted that water though impoſſible to be compreſſed hath at leaſt forty times more pores than ſolid parts. And as acid particles, joined with thoſe of earth in certain proportions, are ſo cloſely united with them, as to be quite hid and loſt to all appearance, as in mercurius dulcis and common ſulphur, ſo alſo may we conceive the particles of light or fire to be abſorbed and latent in groſſer bodies.

223. It is the opinion of ſir Iſaac Newton, that ſomewhat unknown remains in vacuo, when the air is exhauſted. This unknown medium he calls æther. He ſuppoſ-

eth it to be more ſubtil in it's nature, and more ſwift in its motion, than light, freely to pervade all bodies, and by it's immenſe elaſticity to be expanded throughout all the heavens. It's denſity is ſuppoſed greater in free and open ſpaces, than within the pores of compact bodies. And, in paſſing from the cœleſtial bodies to great diſtances, it is ſuppoſed to grow denſer and denſer continually; and thereby cauſe thoſe great bodies to gravitate towards one another, and their reſpective parts towards their centers, every body endeavouring to paſs from the denſer parts of the medium towards the rarer.

224. The extreme minuteneſs of the parts of this medium and the velocity of their motion, together with it's gravity denſity and elaſtic force, are thought to qualify it for being the cauſe of all the natural motions in the univerſe. To this cauſe are aſcribed the gravity and cohæſion of bodies. The refraction of light is alſo thought to proceed, from the different denſity and elaſtic force of this æthereal medium in different places. The vibrations of this medium alternately concurring with, or obſtructing, the motions of the raies of light, are ſuppoſed to produce the fits of eaſy reflexion or tranſmiſſion. Light by the

vibrations of this medium is thought to communicate heat to bodies. Animal motion and ſenſation are alſo accounted for by the vibrating motions of this ætherial medium, propagated through the ſolid capillaments of the nerves. In a word, all the phænomena and properties of bodies, that were before attributed to attraction, upon later thoughts ſeem aſcribed to this æther, together with the various attractions themſelves.

225. But in the philoſophy of ſir Iſaac Newton, the fits (as they are called) of eaſy tranſmiſſion and reflexion, ſeem as well accounted for by vibrations excited in bodies by the raies of light; and the refraction of light by the attraction of bodies. To explain the vibrations of light by thoſe of a more ſubtil medium, ſeems an uncouth explication. And gravity ſeems not an effect of the denſity and elaſticity of æther, but rather to be produced by ſome other cauſe; which ſir Iſaac himſelf inſinuates to have been the opinion even of thoſe ancients who took vacuum, atoms, and the gravity of atoms for the principles of their philoſophy, tacitly attributing (as he well obſerves) gravity to ſome other cauſe diſtinct from matter, from atoms and,

conſequently, from that homogeneous æther or elaſtic fluid. The elaſticity of which fluid is ſuppoſed to depend upon, to be defined and meaſured by it's denſity; and this by the quantity of matter in one particle, multiplied by the number of particles contained in a given ſpace; and the quantity of matter in any one particle or body of a given ſize to be determined by it's gravity. Should not therefore gravity ſeem the original property and firſt ſuppoſed? On the other hand, if force be conſidered as preſcinded from gravity and matter, and as exiſting only in points or centers, what can this amount to but an abſtract ſpiritual incorporeal force?

226. It doth not ſeem neceſſary from the phænomena, to ſuppoſe any medium more active and ſubtil than light or fire. Light being allowed to move at the rate of about ten millions of miles in a minute, what occaſion is there to conceive another medium of ſtill ſmaller and more moveable parts. Light or fire ſeems the ſame with æther. So the ancients underſtood, and ſo the Greek word implies. It pervades all things (*h*), is every where preſent. And this ſame ſubtil medium

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(*h*) 157.

according to it's various quantities, motions, and determinations, ſheweth it ſelf in different effects or appearances, and is æther, light, or fire.

227. THE Particles of æther fly aſunder with the greateſt force, therefore when united they muſt (according to the Newtonian doctrine) attract each other with the greateſt force; therefore they are acids (*a*) or conſtitute the acid; but this united with earthy parts maketh alkali, as ſir Iſaac teacheth in his tract de acido; alkali, as appears in cantharides and lixivial ſalts, is a cauſtic; cauſtics are fire; therefore acid is fire; therefore æther is fire; and if fire, light. We are not therefore obliged to admit a new medium diſtinct from light, and of a finer and more exquiſite ſubſtance, for the explication of phænomena, which appear to be as well explained without it. How can the denſity or elaſticity of æther account for the rapid flight of a ray of light from the Sun, ſtill ſwifter as it goes farther from the ſun? or how can it account for the various motions and attractions of different bodies? Why oyl and water, mercury and iron repell, or why other bodies attract each other? or why

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(*a*) 130.

why a particle of light ſhould repell on one ſide and attract on the other, as in the caſe of the Iſlandic cryſtal? To explain cohæſion by hamate atoms is accounted ignotum per ignotius. And is it not as much ſo to account for the gravity of bodies by the elaſticity of æther?

228. It is one thing to arrive at general laws of nature from a contemplation of the phænomena; and another to frame an hypotheſis, and from thence deduce the phænomena. Thoſe who ſuppoſed epicycles, and by them explained the motions and appearances of the planets, may not therefore be thought to have diſcovered principles true in fact and nature. And albeit we may from the premiſes infer a concluſion, it will not follow, that we can argue reciprocally, and from the concluſion infer the premiſes. For inſtance, ſuppoſing an elaſtic fluid, whoſe conſtituent minute particles are equidiſtant from each other and of equal denſities and diameters, and recede one from another with a centrifugal force which is inverſly as the diſtance of the centers, and admitting that from ſuch ſuppoſition it muſt follow, that the denſity and elaſtic force of ſuch fluid are in the in-

verſe proportion of the ſpace it occupies when compreſſed by any force; yet we cannot reciprocally infer, that a fluid endued with this property muſt therefore conſiſt of ſuch ſuppoſed equal particles; for it would then follow, that the conſtituent particles of air were of equal denſities and diameters; whereas it is certain, that air is an heterogenous maſs, containing in it's compoſition an infinite variety of exhalations, from the different bodies which make up this terraqueous globe.

229. THE phænomena of light, animal ſpirit, muſcular motion, fermentation, vegetation, and other natural operations, ſeem to require nothing more than the intellectual and artificial fire of Heraclitus, Hippocrates, the Stoics (*b*), and other ancients. Intellect, ſuperadded to æthereal ſpirit, fire, or light, moves, and moves regularly, proceeding, in a method, as the Stoics, or increaſing and diminiſhing by meaſure, as Heraclitus expreſſed it. The Stoics held that Fire comprehended and included the ſpermatic reaſons or forms (λόγους σπερματικοὺς) of all natural things. As the forms of things have their ideal exiſtence in the intellect, ſo it ſhould ſeem that ſeminal

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(*b*) 166, 168.

ſeminal principles have their natural exiſtence in the light (*c*), a medium conſiſting of heterogeneous parts, differing from each other in divers qualities that appear to ſenſe, and not improbably having many original properties, attractions, repulſions and motions, the laws and natures whereof are indiſcernible to us, otherwiſe than in their remote effects. And this animated heterogeneous fire ſhould ſeem a more adequate cauſe, whereby to explain the phænomena of nature, than one uniform ætherial medium.

230. Aristotle indeed excepts againſt the elements being animated. Yet nothing hinders why that power of the ſoul, ſtyled by him κινητικὴ or locomotive, may not reſide therein, under the direction of an intellect, in ſuch ſenſe and as properly as it is ſaid to reſide in animal bodies. It muſt nevertheleſs be owned, that albeit that philoſopher acknowledgeth a divine force or energy in fire, yet to ſay that fire is alive, or that having a ſoul it ſhould not be alive, ſeem to him equally abſurd. See his ſecond book, de partibus animalium.

(*c*) 164.

231. The laws of attraction and repulſion are to be regarded as laws of motion, and theſe only as rules or methods obſerved in the productions of natural effects, the efficient and final cauſes whereof are not of mechanical conſideration. Certainly, if the explaining a phænomenon be to aſſign it's proper efficient and final cauſe (*d*), it ſhould ſeem the mechanical philoſophers never explained any thing; their province being only to diſcover the laws of nature, that is the general rules and methods of motion, and to account for particular phænomena by reducing them under, or ſhewing their conformity to ſuch general rules.

232. Some corpuſcularian philoſophers of the laſt age, have indeed attempted to explain the formation of this world and it's phænomena, by a few ſimple laws of mechaniſm. But if we conſider the various productions of nature, in the mineral, vegetable, and animal parts of the creation, I believe we ſhall ſee cauſe to affirm, that not any one of them has hitherto been, or can be accounted for on principles merely mechanical; and that nothing could be more vain and imaginary, than to ſuppoſe with Deſcartes, that merely from

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(*d*) 154, 155, 160.

a circular motion's being impreſſed by the ſupreme agent on the particles of extended ſubſtance, the whole world with all it's ſeveral parts, appurtenances, and phænomena might be produced, by a neceſſary conſequence from the laws of motion.

233. Others ſuppoſe that God did more at the beginning, having then made the ſeeds of all vegetables and animals, containing their ſolid organical parts in miniature, the gradual filling and evolution of which, by the influx of proper juices, doth conſtitute the generation and growth of a living body. So that the artificial ſtructure, of plants and animals daily generated, requires no preſent exerciſe of art to produce it, having been already framed at the origine of the world, which with all it's parts hath ever ſince ſubſiſted going like a clock or machine by it's ſelf, according to the laws of nature, without the immediate hand of the artiſt. But how can this hypotheſis explain the blended features of different ſpecies in mules and other mongrels? or the parts added or changed, and ſometimes whole limbs loſt by marking in the womb? or how can it account for the reſurrection of a tree from it's ſtump, or the vegetative power

in it's cuttings? in which caſes we muſt neceſſarily conceive ſomething more than the mere evolution of a ſeed.

234. MECHANICAL laws of nature or motion direct us how to act, and teach us what to expect. Where intellect preſides there will be method and order, and therefore rules, which if not ſtated and conſtant would ceaſe to be rules. There is therefore a conſtancy in things, which is ſtyled the courſe of nature (*e*). All the phænomena in nature are produced by motion. There appears an uniform working in things great and ſmall, by attracting and repelling forces. But the particular laws of attraction and repulſion are various. Nor are we concerned at all about the forces, neither can we know or meaſure them otherwiſe than by their effects, that is to ſay the motions, which motions only, and not the forces, are indeed in the bodies (*f*). Bodies are moved to or from each other, and this is performed according to different laws. The natural or mechanic philoſopher endeavours to diſcover thoſe laws by experiment and reaſoning. But what is ſaid of forces reſiding in bodies, whether attracting or repelling, is

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(*e*) 160. (*f*) 155.

to be regarded only as a mathematical hypotheſis, and not as any thing really exiſting in nature.

235. We are not therefore ſeriouſly to ſuppoſe with certain mechanic philoſophers, that the minute particles of bodies have real forces or powers, by which they act on each other, to produce the various phænomena in nature. The minute corpuſcles are impelled and directed, that is to ſay, moved to and from each other according to various rules or laws of motion. The laws of gravity, magnetiſm, and electricity are divers. And it is not known, what other different rules or laws of motion might be eſtabliſhed, by the author of nature. Some bodies approach together, others fly aſunder, and perhaps ſome others do neither. When ſalt of tartar flows per deliquium, it is viſible that the particles of water floating in the air are moved towards the particles of ſalt, and joined with them. And when we behold vulgar ſalt not to flow per deliquium, may we not conclude that the ſame law of nature and motion doth not obtain between it's particles and thoſe of the floating vapours? A drop of water aſſumes a round figure, becauſe it's parts are moved to-

wards each other. But the particles of oyl and vinegar have no ſuch diſpoſition to unite. And when flies walk in water without wetting their feet, it is attributed to a repelling force or faculty in the flie's feet. But this is obſcure, though the phænomenon be plain.

236. It is not improbable, and ſeems not unſupported by experiments, that, as in algebra, where poſitive quantities ceaſe there negative begin, even ſo in mechanics, where attracting forces ceaſe there repelling forces begin: or (to expreſs it more properly) where bodies ceaſe to be moved towards, they begin to be moved from each other. This ſir Iſaac Newton infers from the production of air and vapours, whoſe particles fly aſunder with ſuch vehement force. We behold iron move towards the loadſtone, ſtraws towards amber, heavy bodies towards the earth. The laws of theſe motions are various. And when it is ſaid, that all the motions and changes in the great world ariſe from attraction; the elaſticity of the air, the motion of water, the deſcent of heavy, and the aſcent of light bodies, being all aſcribed to the ſame principle; when from inſenſible attractions of moſt minute particles at the ſmalleſt diſtance, are derived

cohæſion, diſſolution, coagulation, animal ſecretion, fermentation, and all chymical operations; and when it is ſaid, that without ſuch principles there never would have been any motion in the world, and without the continuance thereof all motion would ceaſe. In all this we know or underſtand no more, than that bodies are moved according to a certain order, and that they do not move themſelves.

237. So likewiſe, how to explain all thoſe various motions and effects, by the denſity and elaſticity of æther, ſeems incomprehenſible (*g*). For inſtance, why ſhould the acid particles draw thoſe of water and repell each other? why ſhould ſome ſalts attract vapours in the air, and others not? why ſhould the particles of common ſalt repell each other, ſo as not to ſubſide in water? why ſhould the moſt repellent particles be the moſt attractive upon contact? Or why ſhould the repellent begin where the attractive faculty leaves off, Theſe, and numberleſs other effects ſeem inexplicable on mechanical principles, or otherwiſe than by recourſe to a mind or ſpiritual agent (*h*). Nor will it ſuffice from preſent phænomena and effects, through a chain of

natural

(*g*) 153, 162. (*h*) 154, 220.

natural cauſes, and ſubordinate blind agents, to trace a divine intellect as the remote original cauſe, that firſt created the world, and then ſet it a going. We cannot make even one ſingle ſtep in accounting for the phænomena, without admitting the immediate preſence and immediate action of an incorporeal agent, who connects, moves, and diſpoſes all things, according to ſuch rules, and for ſuch purpoſes as ſeem good to him.

238. It is an old opinion adopted by the moderns, that the elements and other natural bodies are changed each into other (*i*). Now, as the particles of different bodies are agitated by different forces, attracting and repelling, or, to ſpeak more accurately, are moved by different laws, how can theſe forces or laws be changed, and this change accounted for by an elaſtic æther? Such a medium diſtinct from light or fire ſeemeth not to be made out by any proof, nor to be of any uſe in explaining the phænomena. But if there be any medium employed, as a ſubordinate cauſe or inſtrument in attraction, it would rather ſeem to be light (*k*); ſince by an experiment of Mr. Boyl's, amber, that ſhewed no ſign of attraction

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(*i*) 148. (*k*) 152, 156.

tion in the ſhade, being placed where the ſun-beams ſhone upon it, immediately attracted light bodies. Beſides, it hath been diſcovered by ſir Iſaac Newton, and an admirable diſcovery it was, that light is an heterogeneous medium (*a*) conſiſting of particles endued with original diſtinct properties. And upon theſe, if I may venture to give my conjectures, it ſeemeth probable the ſpecific properties of bodies, and the force of ſpecific medicines may depend. Different ſides of the ſame ray ſhall, one approach and the other recede from the Iſlandic Cryſtal; can this be accounted for by the elaſticity of a fine medium, or by the general laws of motion, or by any mechanical principles whatever? And if not, what ſhould hinder but there may be ſpecific medicines, whoſe operation depends not upon mechanical principles, how much ſoever that notion hath been exploded of late years?

239. Why may we not ſuppoſe certain idioſyncraſies, ſympathies, oppoſitions, in the ſolids or fluids or animal ſpirit of a human body, with regard to the fine inſenſible parts of minerals or vegetables, impregnated by rays of light of different properties, not depending

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(*a*) 40, 181.

pending on, the different ſize, figure, number, ſolidity or weight of thoſe particles, nor on the general laws of motion, nor on the denſity or elaſticity of a medium, but merely and altogether on the good pleaſure of the Creator, in the original formation of things? From whence divers unaccountable and unforeſeen motions may ariſe in the animal œconomy; from whence alſo various peculiar and ſpecific virtues may be conceived to ariſe, reſiding in certain medicines and not to be explained by mechanical principles. For although the general known laws of motion are to be deemed mechanical, yet peculiar motions of the inſenſible parts, and peculiar properties depending thereon, are ocult and ſpecific.

240. The words attraction and repulſion may, in compliance with cuſtom, be uſed where, accurately ſpeaking, motion alone is meant. And in that ſenſe it may be ſaid, that peculiar attractions or repulſions in the parts, are attended with ſpecific properties in the wholes. The particles of light are vehemently moved to or from, retained or rejected by, objects. Which is the ſame thing as to ſay with ſir Iſaac Newton, that the particles of acids are endued with great attractive

force (*b*), wherein their activity conſiſts; whence fermentation and diſſolution; and that the moſt repellent are, upon contact, the moſt attracting particles.

241. Gravity and fermentation are received for two moſt extenſive principles. From fermentation are derived the motion and warmth of the heart and blood in animals, ſubterraneous heat, fires, and earthquakes, meteors and changes in the atmoſphere. And, that attracting and repelling forces operate in the nutrition and diſſolution of animal and vegetable bodies, is the doctrine both of Hippocrates and ſir Iſaac Newton. The former of theſe celebrated authors, in his treatiſe concerning diet or regimen, obſerves that in the nouriſhment of man, one part repells and another attracts. And again in the ſame treatiſe two carpenters, ſaith he, ſaw a piece of timber: one draws, the other puſhes: theſe two actions tend to one and the ſame end, though in a contrary direction, one up, the other down: This imitates the nature of man: πνεῦμα τὸ μὲν ἕλκει τὸ δέ ὠθέει

242. It

(*b*) 202.

242. IT is the general maxim of Hippocrates, that the manner wherein nature acts conſiſteth in attracting what is meet and good, and in repelling what is diſagreeable or hurtful. He makes the whole of the animal œconomy to be adminiſtred by the faculties or powers of nature. Nature alone, ſaith he, ſufficeth for all things to animals. She knows of her ſelf what is neceſſary for them. Whence it is plain, he means a conſcious intelligent nature, that preſides and moves the ætherial ſpirit. And though he declares all things are accompliſhed on man by neceſſity, yet it is not a blind fate or chain of mere corporeal cauſes, but a divine neceſſity, as he himſelf expreſly calls it. And what is this but an overruling intelligent power that diſpoſeth of all things?

243. ATTRACTION cannot produce, and in that ſenſe account for the phænomena, being it ſelf one of the phænomena produced and to be accounted for (*c*). Attraction is performed by different laws, and cannot therefore in all caſes be the effect of the elaſticity, of one uniform medium. The phænomena of electrical bodies, the laws and variations of magne-

tiſm,

(*c*) 160, 235.

tiſm, and, not to mention other kinds, even Gravity, is not explained by elaſticity, a phænomenon not leſs obſcure than it ſelf. But then, although it ſhew not the agent, yet it ſheweth a rule and analogy in nature, to ſay, That the ſolid parts of animals are endued with attractive powers whereby from contiguous fluids they draw like to like; and that glands have peculiar powers attractive of peculiar juices (*d*). Nature ſeems better known and explained by attractions and repulſions, than by thoſe other mechanical principles of ſize, figure, and the like: that is by ſir Iſaac Newton, than Deſcartes. And natural philoſophers excell, as they are more or leſs acquainted with the laws and methods obſerved by the author of nature.

244. THE ſize and ſhape of particles and general laws of motion can never explain the ſecretions without the help of attraction, obſcure perhaps as to it's cauſe, but clear as a law. Numberleſs inſtances of this might be given: Lemery the younger thought himſelf obliged to ſuppoſe, the particles of light or fire (contrary to all reaſon) to be of a very groſs kind, even greater than the pores of the burnt brimſtone, in order to account for their being detained or impriſoned therein; but this

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(*d*) 41.

phænomenon is eaſily reduced to attraction. There would be no end of enumerating the like caſes. The activity and force of ætherial ſpirit or fire by the laws of attraction, is imparted to groſſer particles (*e*), and thereby wonderfully ſupports the œconomy of living bodies. By ſuch peculiar compoſitions and attractions it ſeems to be effected, that denſer fluids can paſs where air it ſelf cannot, (as oyl through leather) and therefore through the niceſt and fineſt ſtrainers of an animal or vegetable.

245. THE ancients had ſome general conception of attracting and repelling powers (*g*) as natural principles. Galilæi had particularly conſidered the attraction of gravity, and made ſome diſcovery of the laws thereof. But ſir Iſaac Newton by his ſingular penetration, profound knowledge in geometry and mechanics, and great exactneſs in experiments, hath caſt a new light on natural ſcience. The laws of attraction and repulſion were in many inſtances diſcovered, and firſt diſcovered, by him. He ſhewed their general extent, and therewith as with a key opened ſeveral deep ſecrets of nature, in the knowledge whereof he ſeems to have made a greater progreſs, than

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(*e*) 152, 163. (*g*) 241, 242.

than all the ſects of corpuſcularians together had done before him. Nevertheleſs, the principle of attraction it ſelf is not to be explained by phyſical or corporeal cauſes.

246. THE Carteſians attempted to explain it by the niſus of a ſubtil element, receding from the center of it's motion, and impelling groſſer bodies towards it. Sir Iſaac Newton in his later thoughts ſeems (as was before obſerved) to have adopted ſomewhat not altogether foreign from this notion, aſcribing that to his elaſtic medium (*f*) which Deſcartes did to his ſecond element. But the great men of antiquity reſolved gravity into the immediate action of an intelligent incorporeal being. To which alſo ſir Iſaac Newton himſelf atteſts and ſubſcribes, although he may perhaps ſometimes be thought to forget himſelf, in his manner of ſpeaking of phyſical agents, which in a ſtrict ſenſe are none at all; and in ſuppoſing real forces to exiſt in bodies, in which, to ſpeak truly, attraction and repulſion ſhould be conſidered only as tendencies or motions, that is, as mere effects, and their laws as laws of motion.

(*f*) 237, 238.

247. **Though** it be ſuppoſed the chief buſineſs of a natural philoſopher to trace out cauſes from the effects, yet this is to be underſtood not of agents (*b*) but of principles, that is of component parts, in one ſenſe, or of laws or rules, in another. In ſtrict truth all agents are incorporeal, and as ſuch are not properly of phyſical conſideration. The aſtronomer, therefore, the Mechanic, or the Chymiſt, not as ſuch, but by accident only, treat of real cauſes, agents or efficients. Neither doth it ſeem, as is ſuppoſed by the greateſt of mechanical philoſophers, that the true way of proceeding in their ſcience is, from known motions in nature to inveſtigate the moving forces. Foraſmuch as force is neither corporeal nor belongs to any corporeal thing (*a*); nor yet to be diſcovered by experiments or mathematical reaſonings, which reach no farther than diſcernible effects, and motions in things paſſive and moved.

248. Vis or force is to the ſoul, what extenſion is to the body, ſaith Saint Auguſtin, in his tract concerning the quantity of the ſoul; and without force there is nothing done or made, and conſequently there can be no

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(*b*) 155. (*a*) 220.

no agent. Authority is not to decide in this caſe. Let any one conſult his own notions and reaſon, as well as experience, concerning the origine of motion, and the reſpective natures, properties, and differences of ſoul and body, and he will, if I miſtake not, evidently perceive, that there is nothing active in the later. Nor are they natural agents or corporeal forces, which make the particles of bodies to cohære. Nor is it the buſineſs of experimental philoſophers to find them out.

249. THE mechanical philoſopher, as hath been already obſerved, inquires properly concerning the rules and modes of operation alone, and not concerning the cauſe, foraſmuch as nothing mechanical is or really can be a cauſe (*b*). And although a mechanical or mathematical philoſopher may ſpeak of abſolute ſpace, abſolute motion, and of force as exiſting in bodies, cauſing ſuch motion and proportional thereto; Yet what theſe forces are, which are ſuppoſed to be lodged in bodies, to be impreſſed on bodies, to be multiplied, divided, and communicated from one body to another, and which ſeem to animate bodies like abſtract ſpirits or ſouls, hath been found very difficult, not to ſay impoſſible,

(*b*) 236, 247.

for thinking men to conceive and explain, as may be ſeen by conſulting Borellus de vi percuſſionis, and Torricelli in his lezioni accademiche, among other authors.

250. Nor, if we conſider the proclivity of mankind to realize their notions, will it ſeem ſtrange that mechanic philoſophers and Geomemetricians ſhould, like other men, be miſled by prejudice, and take mathematical hypotheſes for real beings exiſting in bodies, ſo far as even to make it the very aim and end of their ſcience to compute or meaſure thoſe phantomes; whereas it is very certain that nothing in truth can be meaſured * or computed, beſide the very effects or motions themſelves. Sir Iſaac Newton asks, have not the minute particles of bodies certain forces or powers by which they act on one another, as well as on the particles of light, for producing moſt of the phænomena in nature? But in reality, thoſe minute particles are only agitated according to certain laws of nature, by ſome other agent, wherein the force exiſts and not in them, which have only the motion; which motion in the body moved, the Peripatetics rightly judge to be a mere paſſion, but in the mover to be ἐνέργεια or act.

251. It

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* This ſubject is handled at large in my Latin tract de motu, publiſhed above twenty years ago.

251. It paſſeth with many, I know not how, that mechanical principles give a clear ſolution of the phænomena. The Democritic hypotheſis, ſaith Doctor Cudworth, doth much more handſomely and intelligibly ſolve the phænomena, than that of Ariſtotle and Plato. But things rightly conſidered, perhaps it will be found not to ſolve any phænomenon at all. For all phænomena are, to ſpeak truly, appearances in the ſoul or mind, and it hath never been explained, nor can it be explained, how external bodies figures and motions ſhould produce an appearance in the mind. Thoſe principles, therefore, do not ſolve, if by ſolving is meant aſſigning the real, either efficient or final cauſe of appearances, but only reduce them to general rules.

252. There is a certain analogy, conſtancy, and uniformity in the phænomena or appearances of natnre, which are a foundation for general rules: and theſe are a grammar for the underſtanding of nature, or that ſeries of effects in the viſible world, whereby we are enabled to foreſee what will come to paſs, in the natural courſe of things. Plotinus obſerves, in his third Ennead, that the art of preſaging is in ſome ſort the reading of natu-

ral letters denoting order, and that ſo far forth as analogy obtains in the univerſe, there may be vaticination. And in reality, he that foretells the motions of the planets, or the effects of medicines, or the reſults of chymical or mechanical experiments, may be ſaid to do it by natural vaticination.

253. We know a thing when we underſtand it: and we underſtand it, when we can interpret or tell what it ſignifies. Strictly the ſenſe knows nothing. We perceive indeed ſounds by hearing, and characters by ſight. But we are not therefore ſaid to underſtand them. After the ſame manner, the phænomena of nature are alike viſible to all: but all have not alike learned the connexion of natural things, or underſtand what they ſignify, or know how to vaticinate by them. There is no queſtion, ſaith Socrates, in Theæteto, concerning that which is agreeable to each perſon; but concerning what will in time to come be agreeable, of which all men are not equally judges. He who foreknoweth what will be in every kind is the wiſeſt. According to Socrates, you and the cook may judge of a diſh on the table equally well, but while the diſh is making, the cook can better foretell, what will enſue from this or that manner

of composing it. Nor is this manner of reaſoning confined only to morals or politics; but extends alſo to natural ſcience.

254. As the natural connexion of ſigns with the things ſignified is regular and conſtant, it forms a ſort of rational diſcourſe (*c*) and is therefore the immediate effect of an intelligent cauſe. This is agreeable to the philoſophy of Plato and other ancients. Plotinus indeed ſaith, that which acts naturally is not intellection, but a certain power of moving matter, which doth not know but only do. And it muſt be owned, that, as faculties are multiplied by philoſophers according to their operations, the will may be diſtinguiſhed from the intellect. But it will not therefore follow, that the will, which operates in the courſe of nature, is not conducted and applied by intellect, although it be granted that neither will underſtands, nor intellect wills. Therefore, the phænomena of nature, which ſtrike on the ſenſes and are underſtood by the mind, do form not only a magnificent ſpectacle, but alſo a moſt coherent, entertaining, and inſtructive diſcourſe; and to effect this, they are conducted, adjuſted, and ranged by the greateſt wiſdom. This

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(*c*) 152.

language or diſcourſe is ſtudied with different attention, and interpreted with different degrees of skill. But ſo far as men have ſtudied and remarked it's rules, and can interpret right, ſo far they may be ſaid to be knowing in nature. A beaſt is like a man who hears a ſtrange tongue, but underſtands nothing.

255. NATURE, ſaith the learned Doctor Cudworth, is not maſter of art or wiſdom: Nature is ratio merſa et confuſa, reaſon immerſed and plunged into matter, and as it were fuddled in it and confounded with it. But the formation of plants and animals, the motions of natural bodies; their various properties, appearances and viciſſitudes, in a word the whole ſeries of things in this viſible world, which we call the courſe of nature, is ſo wiſely managed and carried on, that the moſt improved human Reaſon cannot thoroughly comprehend even the leaſt particle thereof; ſo far is it from ſeeming to be produced by fuddled or confounded reaſon.

256. NATURAL productions, it is true, are not all equally perfect. But neither doth it ſuit with the order of things, the ſtructure of the univerſe, or the ends of providence that

they ſhould be ſo. General rules, we have ſeen (*d*), are neceſſary to make the world intelligible: and from the conſtant obſervation of ſuch rules, natural evils will ſometimes unavoidably enſue: things will be produced in a ſlow length of time, and arrive at different degrees of perfection.

257. It muſt be owned, we are not conſcious of the ſyſtole and diaſtole of the heart, or the motion of the diaphragm. It may not neverthleſs be thence inferred, that unknowing nature can act regularly, as well as our ſelves. The true inference is, that the ſelf, thinking individual, or humane perſon is not the real author of thoſe natural motions. And in fact no man blames himſelf if they are wrong, or values himſelf if they are right. The ſame may be ſaid of the fingers of a muſician, which ſome object to be moved by habit which underſtands not; it being evident, that what is done by rule muſt proceed from ſomething that underſtands the rule; therefore, if not from the muſician himſelf, from ſome other active intelligence, the ſame perhaps which governs bees and ſpiders, and moves the limbs of thoſe who walk in their ſleep.

(*d*) 249, 252.

258. INSTRUMENTS, occaſions, and ſigns (*e*) do occur in, or rather make up, the whole viſible courſe of nature. Theſe, being no agents themſelves, are under the direction of one agent concerting all for one end, the ſupreme good. All thoſe motions, whether in animal bodies or in other parts of the ſyſtem of nature, which are not effects of particular wills, ſeem to ſpring from the ſame general cauſe with the vegetation of plants, an ætherial ſpirit actuated by a mind.

259. THE firſt poets and Theologers of Greece and the Eaſt conſidered the generation of things, as aſcribed rather to a divine cauſe, but the Phyſici to natural cauſes ſubordinate to, and directed ſtill by a divine; except ſome Corporealiſts and Mechanics who vainly pretended to make a world without a God. The hidden force that unites, adjuſts, and cauſeth all things to hang together, and move in harmony, which Orpheus and Empedocles ſtyled love; This principle of union is no blind principle, but acts with intellect. This divine love and intellect are not themſelves obvious to our view, or otherwiſe diſcerned than in their effects. Intellect enlightens, Love connects

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(*e*) 160.

connects, and the ſoveraign Good attracts all things.

260. All things are made for the ſupreme good, all things tend to that end: and we may be ſaid to account for a thing, when we ſhew that it is ſo beſt. In the Phædon, Socrates declares it to be his opinion, that he, who ſuppoſed all things to have been diſpoſed and ordered by a mind (*f*), ſhould not pretend to aſſign any other cauſe of them. He blames Phyſiologers for attempting to account for phænomena, particularly for gravity and cohæſion, by vortexes and æther, overlooking the τὸ αγαθὸν and τὸ δέον, the ſtrongeſt bond and cement which holds together all the parts of the univerſe, and not diſcerning the cauſe it ſelf from thoſe things which only attend it.

261. As in the microcoſm, the conſtant regular tenor of the motions of the viſcera and contained juices doth not hinder particular voluntary motions to be impreſſed by the mind on the animal ſpirit; even ſo in the mundane ſyſtem, the ſteddy obſervance of certain laws of nature, in the groſſer maſſes and

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(*f*) 154, 160.

and more conſpicuous motions, doth not hinder, but a voluntary agent may ſometimes communicate particular impreſſions to the fine ætheral medium, which in the world anſwers the animal ſpirit in man. Which two (if they are two) although inviſibly and inconceivably ſmall, yet ſeem the real latent ſprings, whereby all the parts of this viſible world are moved; albeit they are not to be regarded as a true cauſe, but only an inſtrument of motion; and the inſtrument not as a help to the Creator, but only as a ſign to the creature.

262. PLOTINUS ſuppoſeth that the ſoul of the univerſe is not the original cauſe or author of the ſpecies, but receives them from Intellect, the true principle of order and diſtinction, the ſource and giver of forms. Others conſider the vegetative ſoul only as ſome lower faculty of a higher ſoul, which animates the fiery ætherial ſpirit (*g*). As for the blots and defects which appear in the courſe of this world, which ſome have thought to proceed from a fatality or neceſſity in nature, and others from an evil principle, that ſame philoſopher obſerves, that it may be the governing Reaſon produceth and ordaineth all thoſe

(*g*) 178.

thoſe things; and, not intending that all parts ſhould be equally good, maketh ſome worſe than others by deſign, as all parts in an animal are not eyes: And in a city, comedy, or picture all ranks, characters, and colours are not equal or like; even ſo exceſſes, defects, and contrary qualities, conſpire to the beauty and harmony of the world.

263. It cannot be denied, that with reſpect to the univerſe of things, we in this mortal ſtate, are like men educated in Plato's cave, looking on ſhadows with our backs turned to the light. But though our light be dim, and our ſituation bad, yet if the beſt uſe be made of both, perhaps ſomething may be ſeen. Proclus, in his commentary on the theology of Plato, obſerves there are two ſorts of philoſophers. The one placed body firſt in the order of beings, and made the faculty of thinking depend thereupon, ſuppoſing that the principles of all things are corporeal: that Body moſt really or principally exiſts, and all other things in a ſecundary ſenſe, and by virtue of that. Others, making all corporeal things to be dependent upon ſoul or mind, think this to exiſt in the firſt place and primary ſenſe, and the being of bodies to be alto-

gether derived from, and preſuppoſe that of the mind.

264. Sense and experience acquaint us, with the courſe and analogy of appearances or natural effects. Thought, reaſon, intellect, introduce us into the knowledge of their cauſes. Senſible appearances, though of a flowing unſtable and uncertain nature, yet having firſt occupied the mind, they do by an early prevention, render the after taſk of thought more difficult: and as they amuſe the eyes and ears, and are more ſuited to vulgar uſes and the mechanic arts of life, they eaſily obtain a preference, in the opinion of moſt men, to thoſe ſuperior principles, which are the later growth of the humane mind arrived to maturity and perfection, but, not affecting the corporeal ſenſe, are thought to be ſo far deficient in point of ſolidity and reality, ſenſible and real to common apprehenſions being the ſame thing. Although it be certain, that the principles of ſcience are neither objects of ſenſe nor imagination; and that intellect and reaſon are alone the ſure guides to Truth.

265. The ſucceſsful curioſity of the preſent age, in arts and experiments and new ſyſtems, is apt to elate men, and make them overlook the ancients. But notwithſtanding that the encouragement and purſe of Princes, and the united endeavours of great ſocieties in theſe later ages, have extended experimental and mechanical knowledge very far, yet it muſt be owned, that the ancients too were not ignorant of many things (*h*), as well in phyſics as metaphyſics, which perhaps are more generally, though not firſt known in theſe modern times.

266. The Pythagoreans and Platoniſts had a notion of the true ſyſtem of the world. They allowed of mechanical principles, but actuated by ſoul or mind: they diſtinguiſhed the primary qualities in bodies from the ſecondary, making the former to be phyſical cauſes, and they underſtood phyſical cauſes in a right ſenſe: they ſaw that a mind infinite in power, unextended, inviſible, immortal, governed, connected and contained all things: they ſaw there was no ſuch thing as real abſolute ſpace: that mind, ſoul or ſpirit, truly and really exiſts: that bodies exiſt only in a

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(*h*) 166, 167, 168, 241, 242, &c.

ſecondary and dependent ſenſe: that the ſoul is the place of forms: that the ſenſible qualities are to be regarded as acts only in the cauſe, and as paſſions in us: they accurately conſidered the differences of intellect, rational ſoul, and ſenſitive ſoul, with their diſtinct acts of intellection, reaſoning, and ſenſation, points wherein the Carteſians and their followers, who conſider ſenſation as a mode of thinking, ſeem to have failed. They knew there was a ſubtil æther pervading the whole maſs of corporeal beings, and which was it ſelf actually moved and directed by a mind: and that phyſical cauſes were only inſtruments, or rather marks and ſigns.

267. THOSE ancient philoſophers underſtood the generation of animals to conſiſt, in the unfolding and diſtending of the minute imperceptible parts of preexiſting animalcules, which paſſeth for a modern diſcovery: this they took for the work of nature, but nature animate and intelligent (*a*): they underſtood that all things were alive and in motion: they ſuppoſed a concord and diſcord, union and diſunion in particles ſome attracting, others repelling each other: and that thoſe attractions and repulſions, ſo various, regular, and uſeful

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(*a*) 172.

ful, could not be accounted for, but by an intelligence preſiding and directing all particular motions, for the conſervation and benefit of the whole.

268. THE Ægyptians, who imperſonated nature, had made her a diſtinct principle, and even deified her under the name of Iſis. But Oſiris was underſtood to be mind or reaſon, chief and ſovereign of all. Oſiris, if we may believe Plutarch, was the firſt, pure, unmixed and holy principle, not diſcernible by the lower faculties; a glympſe whereof like lightening darting forth, irradiates the underſtanding; with regard to which Plutarch adds, that Plato and Ariſtotle termed one part of philoſophy ἐποπτικὸν: to wit, when having ſoared above common mixed objects, and got beyond the precincts of ſenſe and opinion, they arrive to contemplate the firſt and moſt ſimple being, free from all matter and compoſition. This is that ὀυσία ὄντως ὀ͂υσα of Plato which employeth mind alone; which alone governs the ſoul. And the ſoul is that which immediately informs and animates nature.

269. Although the Ægyptians did ſymbolically repreſent the ſupreme divinity ſitting on a lotus, and that geſture hath been interpreted to ſignify, the moſt holy and venerable being to be utterly at reſt repoſing within himſelf; yet, for any thing that appears, this geſture might denote dignity as well as repoſe. And it cannot be denied, that Jamblichus, ſo knowing in the Ægyptian notions, taught there was an intellect that proceeded to generation, drawing forth the latent powers into light in the formation of things. Nor was this to be underſtood of an external world, ſubſiſting in real abſolute ſpace; For it was a doctrine of thoſe ancient Sages, that Soul was the place of forms, as may be ſeen in the twelfth book of the arcane part of divine wiſdom, according to the Ægyptians. This notion was embraced by divers philoſophers of Greece, who may be ſuppoſed to have derived it from the ſame ſource, from whence many of their other opinions were drawn.

270. The doctrine of real abſolute external ſpace, induced ſome modern philoſophers to conclude it was a part or attribute of God, or that God himſelf was ſpace; inaſmuch as

incommunicable attributes of the deity appeared to agree thereto, ſuch as infinity, immutability, indiviſibility, incorporeity, being uncreated, impaſſive, without beginning or ending; not conſidering that all theſe negative properties may belong to nothing. For nothing hath no limits, cannot be moved or changed, or divided, is neither created nor deſtroyed. A different way of thinking appears in the Hermaic as well as other writings of the ancients. With regard to abſolute ſpace, it is obſerved in the Aſclepian dialogue; that the word Space or Place hath by it ſelf no meaning; and again, that it is impoſſible to underſtand what Space alone or pure Space is. And Plotinus acknowledgeth no place but ſoul or mind, expreſly affirming that the ſoul is not in the world, but the world in the ſoul. And farther, the place of the ſoul, ſaith he, is not body, but ſoul is in mind, and body in ſoul. See the third chapter of the fifth book of the fifth Ennead.

271. CONCERNING abſolute ſpace that phantome of the mechanic and Geometrical Philoſophers (*b*), it may ſuffice to obſerve, that it is neither perceived by any ſenſe, nor proved by any reaſon, and was accordingly treated by the

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(*b*) 250.

the greateſt of the ancients as a thing merely viſionary. From the notion of abſolute ſpace ſprings that of abſolute motion *; and in theſe are ultimately founded the notions of external exiſtence, independence, neceſſity, and fate. Which fate, the idol of many moderns, was by old philoſophers differently underſtood, and in ſuch a ſenſe as not to deſtroy the ἀυτεξούσιον of God or man. Parmenides, who thought all things to be made by neceſſity or fate, underſtood juſtice and providence to be the ſame with fate; which, how fixed and cogent ſoever with reſpect to man, may yet be voluntary with reſpect to God. Empedocles declared Fate to be a cauſe uſing principles and elements. Heraclitus taught that Fate was the general reaſon that runs through the whole nature of the univerſe: which nature he ſuppoſed to be an æthereal body, the ſeed of the generation of all things. Plato held Fate to be the eternal reaſon

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* Our judgment in theſe matters is not to be overborn by a preſumed evidence of mathematical notions and reaſonings, ſince it is plain, the mathematicians of this age embrace obſcure notions, and uncertain opinions, and are puzzled about them, contradicting each other and diſputing like other men; witneſs their doctrine of Fluxions, about which within theſe ten years I have ſeen publiſhed above twenty tracts and diſſertations, whoſe authors being utterly at variance, and inconſiſtent with each other, inſtruct by-ſtanders what to think of their pretenſions to evidence.

reaſon or law of nature. Chryſippus ſuppoſed that Fate was a ſpiritual power which diſpoſed the world in order; that it was the reaſon and law of thoſe things which are adminiſtred by providence.

272. All the foregoing notions of Fate, as repreſented by Plutarch, do plainly ſhew that thoſe ancient philoſophers did not mean by Fate a blind, head-long, unintelligent principle, but an orderly ſettled courſe of things conducted by a wiſe and provident mind. And as for the Ægyptian doctrine, it is indeed aſſerted in the Pimander, that all things are produced by Fate. But Jamblichus, who drew his notions from Ægypt, affirms that the whole of things is not bound up in Fate; but that there is a principle of the ſoul higher than nature, whereby we may be raiſed to an union with the Gods and exempt our ſelves from Fate. And in the Aſclepian dialogue it is expreſſly ſaid that fate follows the decrees of God. And indeed as all the motions in nature are evidently the product of reaſon (*c*), it ſhould ſeem there is no room for neceſſity, in any other ſenſe than that of a ſteady regular courſe.

273. BLIND

(*c*) 154.

273. Blind ſate and blind chance are at bottom much the ſame thing, and one no more intelligible than the other. Such is the mutual relation, connection, motion, and ſympathy of the parts of this world, that they ſeem as it were animated and held together by one ſoul: and ſuch is their harmony, order, and regular courſe, as ſheweth the ſoul to be governed and directed by a mind. It was an opinion of remote antiquity that the world was an animal (*d*). If we may truſt the Hermaic writings, the Ægyptians thought all things did partake of life. This opinion was alſo ſo general and current among the Greeks, that Plutarch aſſerts all others held the world to be an animal, and governed by providence, except Leucippus, Democritus, and Epicurus. And although an animal, containing all bodies within it ſelf, could not be touched or ſenſibly affected from without; yet it is plain they attributed to it an inward ſenſe and feeling, as well as appetites and averſions; and that from all the various tones actions and paſſions of the univerſe, they ſuppoſed one ſymphony, one animal act and life to reſult.

274. Jam-

(*d*) 153, 172.

274. JAMBLICHUS declares the world to be one animal, in which the parts however diſtant each from other, are nevertheleſs related and connected by one common nature. And he teacheth, what is alſo a received notion of the Pythagoreans and Platonics that there is no chaſm in nature, but a chain or ſcale of beings riſing by gentle uninterrupted gradations from the loweſt to the higheſt, each nature being informed and perfected by the participation of a higher. As air becomes igneous, ſo the pureſt fire becomes animal, and the animal ſoul becomes intellectual, which is to be underſtood not of the change of one nature into another, but of the connection of different natures, each lower nature being, according to thoſe philoſophers, as it were a receptacle or ſubject for the next above it to reſide and act in.

275. IT is alſo the doctrine of Platonic philoſophers, that intellect is the very life of living things, the firſt principle and exemplar of all, from whence by different degrees are derived the inferior claſſes of life; firſt the rational, then the ſenſitive, after that the vegetal, but ſo as in the rational animal there is ſtill ſomewhat intellectual, again in the ſenſitive

there is ſomewhat rational, and in the vegetal ſomewhat ſenſitive, and laſtly in mixt bodies as metals and minerals ſomewhat of vegetation. By which means the whole is thought to be more perfectly connected. Which doctrine implies that all the faculties, inſtincts, and motions of inferior beings, in their ſeveral reſpective ſubordinations, are derived from and depend upon mind and intellect.

276. Both Stoics and Platonics held the world to be alive, though ſometimes it be mentioned as a ſentient animal, ſometimes as a plant or vegetable. But in this, notwithſtanding what hath been ſurmiſed by ſome learned men, there ſeems to be no Atheiſm. For ſo long as the world is ſuppoſed to be quicken'd by elementary fire or ſpirit, which is it ſelf animated by ſoul, and directed by underſtanding, it follows that all parts thereof originally depend upon, and may be reduced unto, the ſame indiviſible ſtem or principle, to wit, a ſupreme mind; which is the concurrent doctrine of Pythagoræans, Platonics, and Stoics.

277. There is according to thoſe philoſophers a life infuſed throughout all things: the πῦρ νοερὸν, πῦρ τεχνικὸν an intellectual and

artificial fire (*e*), an inward principle, animal ſpirit, or natural life producing and forming within as art doth without, regulating, moderating and reconciling the various motions qualities and parts of this mundane ſyſtem. By virtue of this life the great maſſes are held together in their orderly courſes, as well as the minuteſt particles governed in their natural motions, according to the ſeveral laws of attraction, gravity, electricity, magnetiſm, and the reſt. It is this gives inſtincts, teaches the ſpider her web, and the bee her honey. This it is that directs the roots of plants to draw forth juices from the earth, and the leaves and cortical veſſels to ſeparate and attract ſuch particles of air, and elementary fire, as ſuit their reſpective natures.

278. Nature ſeems to be not otherwiſe diſtinguiſhed from the anima mundi, than as life is from ſoul, and upon the principles of the oldeſt philoſophers, may not improperly or incongruouſly be ſtyled the Life of the world. Some Platonics indeed, regard Life as the act of nature, in like manner as intellection is of the mind or intellect. As the firſt intellect acts by underſtanding, ſo nature ac-

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(*e*) 166, 168, 174, 175, &c.

cording to them acts or generates by living. But life is the act of the ſoul, and ſeems to be very nature it ſelf, which is not the principle, but the reſult of another and higher principle, being a life reſulting from ſoul, as cogitation from intellect.

279. If nature be the life of the world, animated by one ſoul, compacted into one frame, and directed or governed in all parts by one mind; This ſyſtem cannot be accuſed of Atheiſm; though perhaps it may of miſtake or impropriety. And yet, as one preſiding mind gives unity to the infinite aggregate of things, by a mutual communion of actions and paſſions, and an adjuſtment of parts, cauſing all to concur in one view to one and the ſame end, the ultimate and ſupreme good of the whole, it ſhould ſeem reaſonable to ſay, with Ocellus Lucanus the Pythagoræan, that as life holds together the bodies of animals, the cauſe whereof is the ſoul; and as a city is held together by concord, the cauſe whereof is law; even ſo the world is held together by harmony, the cauſe whereof is God. And in this ſenſe, the world or univerſe may be conſidered either as one animal (*f*) or one city.

(*f*) 172, 277.

280. **Aristotle** diſapproves the opinion of thoſe who hold a ſoul to be diffuſed throughout the world; and for this reaſon; becauſe the elements are not alive. Though perhaps it may not be eaſy to prove, that blood and animal ſpirit are more alive in man, than water and fire in the world. That Philoſopher, in his books of the Soul, remarks upon an opinion ſet forth in the Orphics, of the Soul's entering from the univerſe into living creatures being born by winds, that this cannot be true of plants or of certain animals which do not breath. But air veſſels are by later experiments allowed to be found in all plants and animals. And air may in ſome ſort not improperly be ſaid, to be the carrier or vehicle of the ſoul, inaſmuch as it is the vehicle of fire, which is the ſpirit immediately moved and animated by the ſoul (*g*).

281. **The** living fire, the living omniform ſeminary of the world, and other expreſſions of the like nature occuring in the ancient and Platonic Philoſophy, how can they be underſtood excluſive of light or elemental fire, the particles of which are known to be heterogeneous

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(*g*) 163, 171.

neous, and, for ought we know, may ſome of them be organized, and, notwithſtanding their wonderful minuteneſs, contain original ſeeds which, being formed and ſown in a proper matrix, do gradually unfold and manifeſt themſelves, ſtill growing to a juſt proportion of the ſpecies.

282. May not this æthereal ſeminary, conſiſtently with the notions of that philoſophy, which aſcribed much of generation to celeſtial influence, be ſuppoſed to impregnate plants and animals with the firſt principles, the ſtamina, or thoſe animalcules which Plato, in his Timæus, ſaith are inviſible for their ſmalneſs, but, being ſown in a proper matrix, are therein gradually diſtended and explicated by nouriſhment, and at length the animals brought forth to light. Which notion hath been revived and received of late years by many, who perhaps are not aware of it's antiquity, or that it was to be found in Plato. Timæus Locrenſis in his book of the ſoul of the World, ſuppoſeth even ſouls to be derived from the cæleſtial luminaries, excepting only the rational or intellectual part. But what influence or influx is there from the cæleſtial bodies, which hath not light for it's vehicle (*h*)?

(*h*) 43.

283. WHAT other nature there ſhould be intermediate between the ſoul of the World (*a*) and this groſs corporeal ſyſtem, which might be the vehicle of life, or, to uſe the language of philoſophers, might receive or be impreſſed with the forms of things, is difficult to comprehend. It is a vulgar remark, that the works of art do not bear a nice microſcopical inſpection, but the more helps are uſed, and the more nicely you pry into natural productions, the more do you diſcover of the fine mechaniſm of nature, which is endleſs or inexhauſtible; new and other parts, more ſubtile and delicate than the precedent, ſtill continuing to offer themſelves to view. And theſe microſcopical obſervations have confirmed the ancient theory concerning generation, delivered in the Timæus of Plato. But that theory or hypotheſis, how agreeable ſoever to modern diſcoveries, is not alone ſufficient to explain the phænomena, without the immediate action of a mind. And Ficinus, notwithſtanding what himſelf and other Platonics ſay of a plaſtic nature, is obliged to own, that with the mundane force or ſoul it is to be underſtood, there is joined an intelligence, upon which

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(*a*) 171.

which the ſeminal nature conſtantly depends, and by which it is governed.

284. Alcinous in his tract of the doctrine of Plato ſaith that God hath given the world both mind and ſoul: others include both in the word ſoul, and ſuppoſe the ſoul of the world to be God. Philo appears to be of this opinion in ſeveral parts of his writings. And Virgil, who was no ſtranger to the Pythagoræan and Platonic tenets writes to the ſame purpoſe.

> Deum namque ire per omnes
> Terras que tractuſque maris cœlumque profundum.
> Hinc pecudes armenta, viros, genus omne ferarum
> Quemque ſibi tenues naſcentem arceſſere vitas.

Thus much the ſchools of Plato and Pythagoras ſeem agreed in, to wit, that the ſoul of the world (*b*), whether having a diſtinct mind of it's own, or directed by a ſuperior mind (*c*), doth embrace all it's parts, connect them by an inviſible and indiſſoluble chain, and preſerve them ever well adjuſted and in good order.

285. Naturalists,

(*b*) 153, 172.

(*c*) 154, 279.

285. **Naturalists**, whoſe proper province it is to conſider phænomena, experiments, mechanical organs and motions, do principally regard the viſible frame of things or corporeal world, ſuppoſing ſoul to be contained in body. And this hypotheſis may be tolerated in phyſics, as it is not neceſſary in the arts of dyalling or navigation to mention the true ſyſtem or earth's motion. But thoſe who, not content with ſenſible appearances, would penetrate into the real and true cauſes (the object of theology, metaphyſics, or the philoſophia prima) will rectify this errour, and ſpeak of the world as contained by the ſoul, and not the ſoul by the world.

286. **Aristotle** hath obſerved there were indeed ſome who thought ſo groſly, as to ſuppoſe the univerſe to be one only corporeal and extended nature: but in the firſt book of his metaphyſics he juſtly remarks they were guilty of a great miſtake; foraſmuch as they took into their account the elements of corporeal beings alone; whereas there are incorporeal beings alſo in the univerſe; and while they attempted to aſſign the cauſes of generation and corruption, and account for the nature of all things, they did at

the ſame time deſtroy the very cauſe of motion.

287. It is a doctrine among other ſpeculations contained in the Hermaic writings, that all things are one. And it is not improbable that Orpheus, Parmenides, and others among the Greeks, might have derived their notion of τὸ ἓν from Ægypt. Though that ſubtil metaphyſician Parmenides, in his doctrine of ἓν ἑϛὼς ſeems to have added ſomething of his own. If we ſuppoſe, that one and the ſame mind is the univerſal principle of order and harmony throughout the world, containing and connecting all it's parts, and giving unity to the ſyſtem, there ſeems to be nothing atheiſtical or impious in this ſuppoſition.

288. Number is no object of ſenſe: it is an act of the mind. The ſame thing in a different conception is one or many. Comprehending God and the creatures in one general notion, we may ſay that all things together make one univerſe, or τὸ πᾶν. But if we ſhould ſay, that all things make one God; this would, indeed, be an erroneous notion of God, but would not amount to Atheiſm, ſo long as mind or intellect was admitted to be the τὸ ἡγεμονικὸν, the governing part. It is

nevertheleſs more reſpectful, and conſequently the truer notion of God, to ſuppoſe him neither made up of parts, nor to be himſelf a part of any whole whatſoever.

289. All thoſe, who conceived the univerſe to be an animal, muſt in conſequence of that notion, ſuppoſe all things to be one. But to conceive God to be the ſentient Soul of an animal, is altogether unworthy and abſurd. There is no ſenſe, nor ſenſory, nor any thing like a ſenſe or ſenſory in God. Senſe implies an impreſſion from ſome other being, and denotes a dependence in the Soul which hath it. Senſe is a paſſion: and paſſions imply imperfection. God knoweth all things, as pure mind or intellect, but nothing by ſenſe, nor in nor through a ſenſory. Therefore to ſuppoſe a ſenſory of any kind, whether ſpace or any other, in God would be very wrong, and lead us into falſe conceptions of his nature. The preſuming there was ſuch a thing as real abſolute uncreated ſpace, ſeems to have occaſioned that modern miſtake. But this preſumption was without grounds.

290. Body is oppoſite to ſpirit or mind. We have a notion of ſpirit from thought and action. We have a notion of body from re-

ſiſtance. So far forth as there is real power, there is ſpirit. So far forth as there is reſiſtance, there is inability or want of power. That is, there is a negation of ſpirit. We are embodied, that is, we are clogged by weight, and hindered by reſiſtance. But in reſpect of a perfect ſpirit, there is nothing hard or impenetrable: there is no reſiſtance to the deity: Nor hath he any Body: Nor is the ſupreme being united to the world, as the ſoul of an animal is to it's body, which neceſſarily implieth defect, both as an inſtrument and as a conſtant weight and impediment.

291. THUS much it conſiſts with piety to ſay, that a divine agent doth by his virtue permeate and govern the elementary fire or light, (*d*) which ſerves as animal ſpirit to enliven and actuate the whole maſs, and all the members of this viſible world. Nor is this doctrine leſs philoſophical than pious. We ſee all nature alive or in motion. We ſee water turned into air, and air rarefied and made elaſtic (*e*) by the attraction of another medium, more pure indeed, more ſubtil and more volatile than air. But ſtill, as this is a moveable extended and, conſequently, a corporeal

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(*d*) 157, 172. (*e*) 149, 152, 200.

poreal being, (*f*) it cannot be it ſelf the principle of motion, but leads us naturally and neceſſarily to an incorporeal ſpirit or agent. We are conſcious that a ſpirit can begin, alter, or determine motion, but nothing of this appears in body. Nay the contrary is evident, both to experiment and reflection.

292. NATURAL phænomena are only natural appearances. They are, therefore, ſuch as we ſee and perceive them. Their real and objective natures are, therefore, the ſame; paſſive without any thing active, fluent and changing without any thing permanent in them. However, as theſe make the firſt impreſſions, and the mind takes her firſt flight and ſpring, as it were, by reſting her foot on theſe objects, they are not only firſt conſidered by all men, but moſt conſidered by moſt men. They and the phantomes that reſult from thoſe appearances, the children of imagination grafted upon ſenſe, ſuch for example as pure ſpace (*i*) are thought by many the very firſt in exiſtence and ſtability, and to embrace and comprehend all other beings.

(*f*) 207 (*i*) 270.

293. Now although ſuch phantomes as corporeal forces, abſolute motions, and real ſpaces, do paſs in phyſics for cauſes and principles (*g*), yet are they in truth but hypotheſes, nor can they be the objects of real ſcience. They paſs nevertheleſs in phyſics converſant about things of ſenſe, and confined to experiments and mechanics. But when we enter the province of the philoſophia prima, we diſcover another order of beings, mind and it's acts, permanent being, not dependent on corporeal things, nor reſulting, nor connected, nor contained; but containing, connecting, enlivening the whole frame; and imparting thoſe motions, forms, qualities, and that order and ſymmetry to all thoſe tranſient phænomena, which we term the courſe of nature.

294. IT is with our faculties as with our affections: what firſt ſeiſes, holds faſt (*a*). It is a vulgar theme, that man is a compound of contrarieties, which breed a reſtleſs ſtruggle in his nature, between fleſh and ſpirit, the beaſt and the angel, earth and heaven, ever weighed down and ever bearing up. During which

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(*g*) 220, 249, 250. (*a*) 264.

which conflict the character fluctuates: when either ſide prevails, it is then fixed for vice or virtue. And Life from different principles takes a different iſſue. It is the ſame in regard to our faculties. Senſe at firſt beſets and overbears the mind. The ſenſible appearances are all in all: our reaſonings are employed about them: our deſires terminate in them: we look no farther for realities or cauſes; Till intellect begins to dawn, and caſt a ray on this ſhadowy ſcene. We then perceive the true principle of unity, identity, and exiſtence. Thoſe things that before ſeemed to conſtitute the whole of being, upon taking an intellectual view of things, prove to be but fleeting phantomes.

295. FROM the outward form of groſs maſſes which occupy the vulgar, a curious inquirer proceeds to examine the inward ſtructure and minute parts, and from obſerving the motions in nature, to diſcover the laws of thoſe motions. By the way, he frames his hypotheſis and ſuits his language to this natural philoſophy. And theſe fit the occaſion and anſwer the end of a maker of experiments or mechanic, who means only to apply the powers of nature, and reduce the phænomena to rules. But, if proceeding ſtill in his

analyſis and inquiry, he aſcends from the ſenſible into the intellectual world, and beholds things in a new light and a new order. He will then change his ſyſtem and perceive, that what he took for ſubſtances and cauſes are but fleeting ſhadows; that the mind contains all, and acts all, and is to all created beings the ſource of unity and identity, harmony and order, exiſtence and ſtability.

296. It is neither acid, nor ſalt, nor ſulphur, nor air, nor æther, nor viſible corporeal fire, (*b*) much leſs the phantome, fate, or neceſſity, that is the real agent, but by a certain analyſis, a regular connexion and climax, we aſcend through all thoſe mediums to a glympſe of the firſt mover, inviſible, incorporeal, intellectual ſource of life and being. There is, it muſt be owned, a mixture of obſcurity and prejudice in humane ſpeech and reaſonings. This is unavoidable, ſince the veils of prejudice and errour are ſlowly and ſingly taken off one by one. But if there are many links in the chain which connects the two extremes of what is groſly ſenſible and purely intelligible, and it ſeem a tedious work, by the ſlow helps of memory, imagination, and reaſon, oppreſſed and overwhelmed,

(*b*) 155.

whelmed, as we are, by the ſenſes, through erroneous principles and long ambages of words and notions, to ſtruggle upwards into the light of Truth, yet as this gradually dawns, further diſcoveries ſtill correct the ſtyle and clear up the notions.

297. THE mind, her acts, and faculties, furniſh a new and diſtinct claſs of objects (*c*), from the contemplation whereof ariſe certain other notions, principles, and verities, ſo remote from, and even ſo repugnant to, the firſt prejudices which ſurpriſe the ſenſe of mankind, that they may well be excluded from vulgar ſpeech and books, as abſtract from ſenſible matters, and more fit for the ſpeculation of Truth, the labour and aim of a few, than for the practice of the world, or the ſubjects of experimental or mechanical inquiry. Nevertheleſs though, perhaps, it may not be reliſhed by ſome modern readers, yet the treating in phyſical books concerning metaphyſical and divine matters can be juſtified by great authorities among the ancients; not to mention, that he, who profeſſedly delivers the elements of a ſcience, is more obliged to method and ſyſtem, and tyed down to more rigorous laws, than a mere eſſay writer. It

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(*c*) 163, 266.

may, therefore, be pardoned if this rude eſſay doth, by inſenſible tranſitions, draw the reader into remote inquiries and ſpeculations, that were not thought of, either by him or by the author, at firſt ſetting out.

298. There are traces of profound thought as well as primæval tradition in the Platonic, Pythagorean, Ægyptian, and Chaldaic philoſophy (*p*). Men in thoſe early days were not overlaid with languages and literature. Their minds ſeem to have been more exerciſed, and leſs burthened, than in later ages; and, as ſo much nearer the beginning of the world, to have had the advantage of patriarchal lights handed down through a few hands. It cannot indeed be affirmed (how probable ſoever it may ſeem) that Moſes was that ſame Mochus, with whoſe ſucceſſors, prieſts and prophets, Pythagoras is ſaid to have converſed at Sidon. Yet the ſtudy of philoſophy appears to be of very great antiquity and remote original; inaſmuch as Timæus Locrenſis, that ancient Pythagorean, author of the book concerning the ſoul of the world, ſpeaks of a moſt ancient philoſophy, even in his time, ἁ πρεσβύστα φιλοσοφία, ſtirring up and recovering the

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(*p*) 179, 266.

the ſoul from a ſtate of ignorance to the contemplation of divine things. And though the books attributed to Mercurius Triſmegiſtus were none of them wrote by him, and are allowed to contain ſome manifeſt forgeries: yet it is alſo allowed, that they contain tenets of the ancient Ægyptian phyloſophy, though dreſſed perhaps in a more modern garb. To account for which, Jamblichus obſerves, that the books under his name contain indeed mercurial opinions, though often expreſſed in the ſtyle of the Greek Philoſophers; as having been tranſlated from the Ægyptian tongue into Greek.

299. THE difference of Iſis from Oſiris (*d*) reſembles that of the moon from the ſun, of the female from the male, of natura naturata (as the ſchoolmen ſpeak) from natura naturans. But Iſis, though moſtly taken for nature, yet (as the Pagan divinities were very fluctuating things) it ſometimes ſignified τὸ πᾶν. And we find in Mountfaucon an Iſis of the ordinary form with this Inſcription θεοῦ πανδὸς. And in the menſa Iſiaca, which ſeems to exhibit a general ſyſtem of the religion and ſuperſtition of the Ægytians, Iſis on her throne poſſeſſeth the center of the

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(*d*) 268.

table. Which may ſeem to ſignify, that the univerſe or τὸ πᾶν was the center of the ancient ſecret religion of the Ægyptians; their Iſis or τὸ πᾶν comprehending both Oſiris the author of nature and his work.

300. **Plato** and Ariſtotle conſidered God as abſtracted or diſtinct from the natural world. But the Ægyptians conſidered God and nature as making one whole, or all things together as making one univerſe. In doing which they did not exclude the intelligent mind, but conſidered it as containing all things. Therefore, whatever was wrong in their way of thinking, it doth not, nevertheleſs, imply or lead to Atheiſm.

301. **The** humane mind is ſo much clogged and born downward, by the ſtrong and early impreſſions of ſenſe (*e*), that it is wonderful, how the ancients ſhould have made even ſuch a progreſs, and ſeen ſo far into intellectual matters, without ſome glimmering of a divine tradition. Whoever conſiders a parcel of rude Savages left to themſelves, how they are ſunk and ſwallowed up in ſenſe and prejudice, and how unqualified by their natural

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(*e*) 264.

natural force to emerge from this ſtate, will be apt to think that the firſt ſpark of philoſophy was derived from Heaven ; and that it was (as a Heathen writer expreſſeth it) θεοπαράδοτος φιλοσοφία.

302. THE lapſed ſtate of Human kind is a thing to which the ancient Philoſophers were not ſtrangers. The λύσις, the φύγη, the παλιγγενεσία ſhew that the Ægyptians and Pythagoreans, the Platoniſts and Stoics, had all ſome notion of this doctrine, the outlines of which ſeem to have been sketched out in thoſe tenets. Theology and philoſophy gently unbind the ligaments, that chain the ſoul down to the earth, and aſſiſt her flight towards the ſovereign Good. There is an inſtinct or tendency of the mind upwards, which ſheweth a natural endeavour to recover and raiſe our ſelves, from our preſent ſenſual and low condition, into a ſtate of light, order, and purity.

303. THE perceptions of ſence are groſs : but even in the ſenſes there is a difference. Though harmony and proportion are not objects of ſenſe, yet the eye and the ear are organs, which offer to the mind ſuch materials, by means whereof ſhe may apprehend

both the one and the other. By experiments of ſenſe we become acquainted with the lower faculties of the ſoul; and from them, whether by a gradual (*k*) evolution or aſcent, we arrive at the higheſt. Senſe ſupplies images to memory. Theſe become ſubjects for fancy to work upon. Reaſon conſiders and judges of the imaginations. And theſe acts of reaſon become new objects to the underſtanding. In this ſcale, each lower faculty is a ſtep that leads to one above it. And the uppermoſt naturally leads to the Deity, which is rather the object of intellectual knowledge than even of the diſcurſive faculty, not to mention the ſenſitive. There runs a chain throughout the whole ſyſtem of beings. In this chain one link drags another. The meaneſt things are connected with the higheſt. The calamity therefore is neither ſtrange nor much to be complained of, if a low ſenſual reader ſhall, from mere love of the animal life, find himſelf drawn on, ſurpriſed, and betray'd into ſome curioſity concerning the intellectual.

304. There is according to Plato properly no knowledge, but only opinion concerning things ſenſible and periſhing (*f*), not becauſe they are naturally abſtruſe and involved in darkneſs:

(*k*) 275. (*f*) 263, 264.

darkneſs: but becauſe their nature and exiſtence is uncertain, ever fleeting and changing. Or rather, becauſe they do not in ſtrict truth exiſt at all, being always generating or in fieri, that is, in a perpetual flux, without any thing ſtable or permanent in them to conſtitute an object of real ſcience. The Pythagoreans and Platonics diſtinguiſh between τὸ γενόμενον and τὸ ὂν that which is ever generated and that which exiſts. Senſible things and corporeal forms are perpetually producing and periſhing, appearing and diſappearing, never reſting in one ſtate, but always in motion and change; and therefore in effect, not one being but a ſucceſſion of beings: while τὸ ὂν is underſtood to be ſomewhat of an abſtract or ſpiritual nature, and the proper object of intellectual knowledge. Therefore as there can be no knowledge of things flowing and inſtable, the opinion of Protagoras and Theætetus, that ſenſe was ſcience, is abſurd. And indeed nothing is more evident, than that the apparent ſizes and ſhapes, for inſtance, of things are in a conſtant flux, ever differing as they are view'd at different diſtances, or with glaſſes more or leſs accurate. As for thoſe abſolute magnitudes and figures, which certain Carteſians and other moderns ſuppoſe to be in things; that muſt ſeem a vain ſuppoſition, to whoever conſiders, it is ſupported by no argument of Reaſon, and no experiment of ſenſe.

305. As Underſtanding perceiveth not, that is, doth not hear or ſee or feel, ſo ſenſe knoweth not: And although the mind may uſe both ſenſe and phancy, as means whereby to arrive at knowledge, yet ſenſe or ſoul, ſo far forth as ſenſitive, knoweth nothing. For, as it is rightly obſerved in the Theætetus of Plato, ſcience conſiſts not in the paſſive perceptions, but in the reaſoning upon them, τῷ περὶ ἐκείνων συλλογισμῷ.

306. In the ancient philoſophy of Plato and Pythagoras, we find diſtinguiſhed three ſorts of objects: In the firſt place a form or ſpecies that is neither generated nor deſtroy'd, unchangeable, inviſible, and altogether imperceptible to ſenſe, being only underſtood by the intellect. A ſecond ſort there is ever fluent and changing (*g*), generating and periſhing, appearing and vaniſhing. This is comprehended by ſenſe and opinion. The third kind is matter which, as Plato teacheth, being neither an object of underſtanding nor of ſenſe, is hardly to be made out by a certain

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(*g*) 292, 293.

certain ſpurious way of reaſoning λογισμῷ τινι νόθῳ μόγις πιστὸν. See his Timæus. The ſame doctrine is contained in the Pythagoric treatiſe de anima mundi, which diſtinguiſhing ideas, ſenſible things, and matter, maketh the firſt to be apprehended by intellect, the ſecond by ſenſe, and the laſt, to wit, matter, λογισμῷ νόθῳ. whereof Themiſtius the Peripatetic aſſigns the reaſon. For, ſaith he, that act is to be eſteemed ſpurious, whoſe object hath nothing poſitive, being only a mere privation, as ſilence or darkneſs. And ſuch he accounteth matter.

307. Aristotle maketh a threefold diſtinction of objects according to the three ſpeculative ſciences. Phyſics he ſuppoſeth to be converſant about ſuch things as have a principle of motion in themſelves, mathematics about things permanent but not abſtracted, and theology about being abſtracted and immoveable, which diſtinction may be ſeen in the ninth book of his metaphyſics. Where by abſtracted, χωριστόν, he underſtands ſeparable from corporeal beings and ſenſible qualities.

308. That philoſopher held that the mind of man was a tabula raſa, and that there were no innate ideas. Plato, on the contrary, held original ideas in the mind, that is, notions which never were or can be in the ſenſe, ſuch as being, beauty, goodneſs, likeneſs, parity. Some perhaps may think the truth to be this: that there are properly no ideas or paſſive objects in the mind, but what were derived from ſenſe: but that there are alſo beſides theſe her own acts or operations: ſuch are notions.

309. It is a maxim of the Platonic philoſophy, that the ſoul of man was originally furniſhed with native inbred notions, and ſtands in need of ſenſible occaſions, not abſolutely for producing them, but only for awakening, rouſing or exciting, into act what was already preexiſtent, dormant, and latent in the ſoul; as things are ſaid to be laid up in the memory, though not actually perceived, until they happen to be called forth and brought into view by other objects. This notion ſeemeth ſomewhat different from that of innate ideas, as underſtood by thoſe moderns who have attempted to explode them.

To underſtand and to be, are according to Parmenides the ſame thing. And Plato in his ſeventh letter makes no difference between νοῦς and ἐπιστήμη. mind and knwledge. Whence it follows that mind, knowledge, and notions, either in habit or in act, always go together.

310. And albeit Ariſtotle conſidered the ſoul in it's original ſtate as a blank paper, yet he held it to be the proper place of forms, τὴν ψυχὴν εἶναι τόπον εἰδῶν (a). Which doctrine firſt maintained by others he admits, under this reſtriction, that it is not to be underſtood of the whole ſoul but only of the νοητικῆς; as is to be ſeen in his third book de anima. Whence, according to Themiſtius in his commentary on that treatiſe, it may be inferred that all beings are in the ſoul. For, ſaith he, the forms are the beings. By the form every thing is what it is. And he adds, it is the ſoul that imparteth forms to matter; τὴν ὕλην μορφῶσα ποικίλαις μόρφαις. Therefore they are firſt in the ſoul. He farther adds, that the mind is all things, taking the forms of all things it becomes all things by intellect and ſenſe. Alexander Aphrodiſæus ſaith as

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(a) 269.

much, affirming the mind to be all things κατά τε τὸ νοεῖν καὶ τὸ αἰσθάνεσθαι. And this in fact is Ariſtotle's own doctrine in his third book de anima, where he alſo aſſerts, with Plato, that actual knowledge and the thing known are all one. τὸ ἀυτὸ δὲ ἐστὶν ἡ κατ' ἐνέργειαν ἐπιστήμη τῷ πράγματι. Whence it follows that the things are where the knowledge is, that is to ſay, in the mind. Or, as it is otherwiſe expreſſed, that the ſoul is all things. More might be ſaid to explain Ariſtotle's notion, but it would lead too far.

311. As to an abſolute actual exiſtence (*b*) of ſenſible or corporeal things, it doth not ſeem to have been admitted either by Plato or Ariſtotle. In the Theætetus we are told, that if any one ſaith a thing is or is made, he muſt withal ſay, for what, or of what, or in reſpect of what, it is or is made; for, that any thing ſhould exiſt in it ſelf or abſolutely is abſurd. Agreeably to which doctrine it is alſo farther affirmed by Plato, that it is impoſſible a thing ſhould be ſweet, and ſweet to no body. It muſt nevertheleſs be owned with regard to Ariſtotle, that, even in his metaphyſics there are ſome expreſſions which ſeem to favour the abſolute exiſtence

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(*b*) 264, 292, 294.

exiſtence of corporeal things. For inſtance, in the eleventh book ſpeaking of corporeal ſenſible things, what wonder, ſaith he, if they never appear to us the ſame, no more than to ſick men, ſince we are always changing and never remain the ſame our ſelves? and again, he ſaith, ſenſible things, although they receive no change in themſelves, do nevertheleſs in ſick perſons produce different ſenſations and not the ſame. Theſe paſſages would ſeem to imply a diſtinct and abſolute exiſtence of the objects of ſenſe.

312. BUT it muſt be obſerved, that Ariſtotle diſtinguiſheth a twofold exiſtence potential and actual. It will not, therefore, follow that, according to Ariſtotle, becauſe a thing is, it muſt actually exiſt. This is evident from the eighth book of his metaphyſics, where he animadverts on the Megaric philoſophers, as not admitting a poſſible exiſtence diſtinct from the actual: from whence, ſaith he, it muſt follow, that there is nothing cold or hot or ſweet or any ſenſible thing at all, where there is no perception. He adds, that in conſequence of that Megaric doctrine, we can have no ſenſe but while we actually exert it: we are blind

when we do not ſee, and therefore both blind and deaf ſeveral times in a day.

313. THE ἐντελέχειαι πρῶται of the Peripatetics, that is, the ſciences arts and habits, were by them diſtinguiſhed from the arts or ἐντελέχειαι δεύτεραι, and ſuppoſed to exiſt in the mind, though not exerted or put into act. This ſeems to illuſtrate the manner in which Socrates, Plato, and their followers conceived innate (*c*) notions to be in the ſoul of man. It was the Platonic doctrine, that humane ſouls or minds deſcended from above, and were ſowed in generation, that they were ſtunned, ſtupified, and intoxicated by this deſcent and immerſion into animal nature. And that the ſoul, in this ὀνείρωξις or ſlumber, forgets her original notions, which are ſmothered and oppreſſed by many falſe tenets and prejudices of ſenſe. Inſomuch that Proclus compares the ſoul, in her deſcent inveſted with growing prejudices, to Glaucus diving to the bottom of the ſea, and there contracting divers coats of ſea weed, coral, and ſhells, which ſtick cloſe to him and conceal his true ſhape.

(*c*) 399.

314. Hence, according to this philoſophy, the mind of man is ſo reſtleſs to ſhake off that ſlumber, to diſengage and emancipate her ſelf from thoſe prejudices and falſe opinions, that ſo ſtraitly beſet and cling to her, to rub off thoſe covers, that diſguiſe her original form, and to regain her primæval ſtate and firſt notions: Hence, that perpetual ſtruggle to recover the loſt region of light, that ardent thirſt and endeavour after truth and intellectual ideas, which ſhe would neither ſeek to attain, nor rejoice in, nor know when attained, except ſhe had ſome prænotion or anticipation of them, and they had lain innate and dormant like habits and ſciences in the mind, or things laid up, which are called out and rouſed by recollection or reminiſcence. So that learning ſeemeth in effect reminiſcence.

315. The Peripatetics themſelves diſtinguiſh between reminiſcence and mere memory. Themiſtius obſerves that commonly the beſt memories commonly go with the worſt parts; but that reminiſcence is moſt perfect in the moſt ingenious minds. And notwithſtanding the tabula raſa (*d*) of Ariſtotle, yet ſome

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(*d*) 308.

ſome of his followers have undertaken to make him ſpeak Plato's ſenſe. Thus Plutarch the Peripatetic teacheth, as agreeable to his maſter's doctrine, that learning is reminiſcence, and that the νοῦς καθ' ἕξιν is in children. Simplicius alſo, in his Commentary on the third book of Ariſtotle περὶ ψυχης, ſpeaketh of a certain interiour reaſon in the ſoul, acting of it ſelf, and originally full of it's own proper notions, πλήρης ἀφ' ἑαυτοῦ τῶν οἰκείων γνωστῶν.

316. AND, as the Platonic philoſophy ſuppoſed intellectual notions to be originally inexiſtent or innate in the ſoul (e), ſo likewiſe it ſuppoſed ſenſible qualities to exiſt (though not originally) in the ſoul, and there only. Socrates ſaith to Theætetus, you muſt not think the white colour that you ſee is in any thing without your eyes, or in your eyes, or in any place at all. And in the Timæus Plato teacheth, that the figure and motion of the particles of fire dividing the parts of our bodies produce that painful ſenſation we call heat. And Plotinus, in the ſixth book of his ſecond Ænnead, obſerves that heat and other qualities are not qualities in the things themſelves, but acts: that heat is not a qua-

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(e) 309, 314.

lity but act in the fire: that Fire is not really what we perceive in the qualities light, heat, and colour. From all which it is plain, that whatever real things they ſuppoſed to exiſt independent of the ſoul, thoſe were neither ſenſible things, nor cloathed with ſenſible qualities.

317. NEITHER Plato nor Ariſtotle by matter, ὕλη, underſtood corporeal ſubſtance, whatever the moderns may underſtand by that word. To them certainly it ſignified no poſitive actual being. Ariſtotle deſcribes it as made up of negatives, having neither quantity nor quality nor eſſence. And not only the Platoniſts and Pythagoreans, but alſo the Peripatetics themſelves declare it to be known, neither by ſenſe, nor by any direct and juſt reaſoning, but only by ſome ſpurious or adulterine method, as hath been obſerved before. Simon Portius, a famous Peripatetic of the ſixteenth century, denies it to be any ſubſtance at all, for, ſaith he, nequit per ſe ſubſiſtere quia ſequeretur, id quod non eſt in actu eſſe in actu. If Jamblichus may be credited, the Ægyptians ſuppoſed matter ſo far from including ought of ſubſtance or eſſence, that, according to them, God pro-

duced it by a ſeparation from all ſubſtance, eſſence or being, ἀπὸ ὀυσιότητος ἀποχωρισθέισης ὑλότητος. That matter is actually nothing, but potentially all things, is the doctrine of Ariſtotle, Theophraſtus, and all the antient Peripatetics.

318. According to thoſe Philoſophers, matter is only a pura potentia, a mere poſſibility. But Anaximander, ſucceſſor to Thales, is repreſented as having thought the ſupreme deity to be infinite matter. Nevertheleſs though Plutarch calleth it matter, yet it was ſimply τὸ ἄπειρον, which means no more than infinite or indefinite. And although the moderns teach that ſpace is real and infinitely extended: yet if we conſider that it is no intellectual notion, nor yet perceived by any of our ſenſes, we ſhall perhaps be inclined to think with Plato in his Timæus, that this alſo is the reſult of λογισμὸς νόθος or ſpurious reaſoning, and a kind of waking dream. Plato obſerves that we dream, as it were, when we think of place, and believe it neceſſary, that whatever exiſts ſhould exiſt in ſome place. Which place or ſpace (*f*) he alſo obſerves is μετ' ἀναισθησίας ἁπτὸν, that is, to be felt

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(*f*) 250, 270.

felt as darkneſs is ſeen, or ſilence heard, being a mere privation.

319. IF any one ſhould think to infer the reality or actual being of matter from the modern tenet, that gravity is always proportionable to the quantity of matter, let him but narrowly ſcan the modern demonſtration of that tenet, and he will find it to be a vain circle, concluding in truth no more than this, that gravity is proportionable to weight, that is to it ſelf. Since matter is conceived only as defect and mere poſſibility; and ſince God is abſolute perfection and act; it follows there is the greateſt diſtance and oppoſition imaginable between God and Matter. Inſomuch that a material God would be altogether inconſiſtent.

320. THE force that produces, the intellect that orders, the goodneſs that perfects all things is the ſupreme being. Evil, defect, negation, is not the object of God's creative power. From motion the Peripatetics trace out a firſt immoveable mover. The Platonics make God author of all good, author of no evil, and unchangeable. According to Anaxagoras there was a confuſed maſs of all things in one chaos, but mind ſupervening, ἐπελθὼν, diſtinguiſhed and divided them. Anaxagoras,

it ſeems, aſcribed the motive faculty to mind, which mind ſome ſubſequent philoſophers have accurately diſcriminated from ſoul and life, aſcribing to it the ſole faculty of intellection.

321. But ſtill God was ſuppoſed the firſt agent, the ſource and original of all things, which he produceth, not occaſionally or inſtrumentally, but with actual and real efficacy. Thus, the treatiſe, De ſecretiore parte divinæ ſapientiæ ſecundum Ægyptios, in the tenth book, ſaith of God, that he is not only the firſt agent, but alſo that he it is who truly acts or creates, qui verè efficit.

322. Varro, Tully, and St. Auguſtin underſtand the ſoul to be vis, the power, or force that acts, moves, enlivens. Now although, in our conception, vis, or ſpirit might be diſtinguiſhed from mind, it would not thence follow, that it acts blindly or without mind, or that it is not cloſely connected with intellect. If Plutarch is to be truſted in his account of the opinions of Philoſophers; Thales held the mind of the world to be God: Democrius held the ſoul of the world to be an igniform deity (*g*); Pythagoras

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(*g*) 166, 168, 277.

thagoras taught that God was the monad and the good, or τ᾽ ἀγαθὸν: Socrates alſo and Plato pronounced him to be the τὸ ἕν (*b*), the ſingle, ſelf originate one, eſſentially good. Each of which appellations and forms of ſpeech directly tends to, and determines in mind, ἐις τὸν νοῦν σπεύδει ſaith Plutarch.

323. WHENCE that author concludes, that in the ſenſe of thoſe philoſophers God is a mind, χωριστονεῖδος, not an abſtract idea compounded of inconſiſtencies and preſcinded from all real things, as ſome moderns underſtand abſtraction; but a really exiſting ſpirit, diſtinct or ſeparate from all ſenſible and corporeal beings. And although the Stoics are repreſented as holding a corporeal deity, or that the very ſyſtem of the world is God, yet it is certain they did not, at bottom, diſſent from the forementioned doctrine; inaſmuch as they ſuppoſed the world to be an animal, (*a*) conſiſting of ſoul or mind as well as body.

324. THIS notion was derived from the Pythagoreans, who held the world, as Timæus Locrus teacheth, to be one perfect animal, endued with ſoul and reaſon: but

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(*b*) 287. (*a*) 276, 279.

then they believed it to have been generated: Whereas the Stoics looked on the world as the ſupreme God, including therein mind or intellect. For the elementary fire, or, if one may ſo ſpeak, the animal ſpirit of the world, ſeemeth, according to them, to have been the vehicle of the ſoul of the world (*b*), and ſoul it ſelf the vehicle of intellect or νοῦς; ſince they ſtyled the Divinity πῦρ νοερὸν (*c*) or intellectual fire.

325. THE Ægyptians, if we may credit the Hermaic writings, maintained God to be all things, not only actual but poſſible. He is ſtyled by them, that which is made and that which is unmade. And therein it is ſaid, ſhall I praiſe thee for thoſe things thou haſt made manifeſt, or for the things thou haſt hidden? Therefore, in their ſenſe, to manifeſt, was to create; the things created having been before hidden in God.

326. Now, whether the νοῦς be abſtracted from the ſenſible world, and conſidered by it ſelf, as diſtinct from, and preſiding over the created ſyſtem, or whether the whole univerſe, including mind together with the mundane

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(*b*) 277, 284. (*c*) 272.

mundane body, is conceived to be God (*d*), and the creatures to be partial manifeſtations of the divine eſſence, there is no atheiſm in either caſe, whatever miſconceptions there may be; ſo long as mind or intellect is underſtood to preſide over, govern, and conduct the whole frame of things. And this was the general prevailing opinion among the philoſophers.

327. Nor if any one, with Ariſtotle in his metaphyſics, ſhould deny that God knows any thing without himſelf; ſeeing that God comprehends all things, could this be juſtly pronounced an atheiſtical opinion. Nor even was the following notion of the ſame author to be accounted atheiſm, to wit, that there are ſome things beneath the knowledge of God, as too mean, baſe, and vile; however wrong this notion may be, and unworthy of the divine perfection.

328. Might we not conceive that God may be ſaid to be all in divers ſenſes; as he is the cauſe and origine of all beings; as the νοῦς is the νοητὰ, a doctrine both of Platonics and Peripatetics (*e*); as the νοῦς is the place of

(*d*) 300. (*e*) 309, 310.

of all forms, and as it is the ſame which comprehends and orders (*f*) and ſuſtains the whole mundane ſyſtem. Ariſtotle declares, that the divine force or influence permeates the intire univerſe (*g*) and that what the Pilot is in a ſhip, the driver in a chariot, the præcentor in a choir, the law in a city, the general in an army, the ſame God is in the world. This he amply ſets forth in his book de mundo, a treatiſe which having been anciently aſcribed to him, ought not to be ſet aſide from the difference of ſtyle, which (as Patricius rightly obſerves) being in a letter to a King, might well be ſuppoſed to differ from the other dry and crabbed parts of his writings.

329. And although there are ſome expreſſions to be met with in the Philoſophers, even of the Platonic and Ariſtotelic ſects, which ſpeak of God as mixing with, or pervading all nature and all the elements; yet this muſt be explained by force and not by extenſion, which was never attributed to the mind (*h*) either by Ariſtotle or Plato. This they always affirmed to be incorporeal: and, as Plotinus remarks, incorporeal things are diſtant each

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(*f*) 320. (*g*) 173. (*h*) 290, 293, 297, 319.

each from other not by place, but (to uſe his expreſſion) by alterity.

330. These diſquiſitions will probably ſeem dry and uſeleſs, to ſuch readers as are accuſtomed to conſider only ſenſible objects. The employment of the mind on things purely intellectual is to moſt men irkſome: whereas the ſenſitive powers, by conſtant uſe acquire ſtrength. Hence, the objects of ſenſe more forcibly affect us (*k*), and are too often counted the chief good. For theſe things men fight, cheat, and ſcramble. Therefore, in order to tame mankind and introduce a ſenſe of virtue; the beſt humane means is to exerciſe their underſtanding, to give them a glympſe of another world, ſuperior to the ſenſible, and while they take pains to cheriſh and maintain the animal life, to teach them not to neglect the intellectual.

331. Prevailing ſtudies are of no ſmall conſequence to a ſtate, the religion, manners and civil government of a country ever taking ſome bias from it's philoſophy, which affects not only the minds of it's profeſſors and ſtudents, but alſo the opinions of all the better ſort and the practice of the whole

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(*k*) 264, 294.

whole people, remotely and conſequentially indeed, though not inconſiderably. Have not the polemic and ſcholaſtic philoſophy been obſerved to produce controverſies in law and religion? And have not Fataliſm and Sadduciſm gained ground, during the general paſſion for the Corpuſcularian and mechanical philoſophy, which hath prevailed for about a century? This indeed might uſefully enough have employ'd ſome ſhare of the leiſure and curioſity of inquiſitive perſons. But when it enter'd the ſeminaries of learning as a neceſſary accompliſhment, and moſt important part of education, by engroſſing men's thoughts, and fixing their minds ſo much on corporeal objects, and the laws of motion, it hath, however undeſignedly, indirectly, and by accident, yet not a little indiſpoſed them for ſpiritual, moral, and intellectual matters. Certainly had the philophy of Socrates and Pythagoras prevailed in this age, among thoſe who think themſelves too wiſe to receive the dictates of the goſpel, we ſhould not have ſeen intereſt take ſo general and faſt hold on the minds of men, nor public ſpirit reputed to be γεννᾶιαν ἐυήθειαν a generous folly among thoſe who are reckoned to be the moſt knowing as well as the moſt getting part of mankind.

332. It might very well be thought ſerious trifling to tell my readers that the greateſt men had ever an high eſteem for Plato; whoſe writings are the touchſtone of a haſty and ſhallow mind; whoſe philoſophy has been the admiration of ages; which ſupplied patriots, magiſtrates, and lawgivers to the moſt flouriſhing ſtates, as well as fathers to the church, and doctors to the ſchools. Albeit in theſe days, the depths of that old learning are rarely fathomed, and yet it were happy for theſe lands, if our young nobility and gentry inſtead of modern maxims would imbibe the notions of the great men of antiquity. But in theſe freethinking times many an empty head is ſhook at Ariſtotle and Plato, as well as at the holy ſcriptures. And the writings of thoſe celebrated ancients are by moſt men treated on a foot, with the dry and barbarous lucubrations of the ſchoolmen. It may be modeſtly preſumed, there are not many among us, even of thoſe who are called the better ſort, who have more ſenſe, virtue, and love of their country than Cicero, who in a letter to Atticus could not forbear exclaiming, O Socrates et Socratici viri! nunquam vobis

gratiam] referam. Would to God many of our countrymen had the ſame obligations to thoſe Socratic writers. Certainly where the people are well educated, the art of piloting a ſtate is beſt learned from the writings of Plato. But among bad men void of diſcipline and education, Plato, Pythagoras and Ariſtotle themſelves, were they living, could do but little good. Plato hath drawn a very humorous and inſtructive picture of ſuch a ſtate; which I ſhall not tranſcribe for certain reaſons. But whoever has a mind, may ſee it in the ſeventy eighth page of the ſecond tome of Aldus his edition of Plato's works.

333. Proclus, in the firſt book of his commentary on the theology of Plato obſerves that, as in the myſteries, thoſe who are initiated, at firſt meet with manifold and multiform Gods, but being entered and thoroughly initiated they receive the divine illumination and participate the very deity: in like manner, if the ſoul look abroad ſhe beholds the ſhadows and images of things: but returning into her ſelf ſhe unravels and beholds her own eſſence: At firſt ſhe ſeemeth only to behold her ſelf: But having penetrated farther ſhe diſcovers the mind. And again, ſtill farther advancing into the innermoſt ſanctua-

ry of the ſoul ſhe contemplates the ϑεῶν γένος. And this, he ſaith, is the moſt excellent of all humane acts, in the ſilence and repoſe of the faculties of the ſoul to tend upwards to the very divinity; to approach and be cloſely joined with that which is ineffable and ſuperior to all beings. When come ſo high as the firſt principle ſhe ends her journey and reſts. Such is the doctrine of Proclus.

334. But Socrates in the firſt Alcibiades teacheth on the other hand, that the contemplation of God is the proper means to know or underſtand our own ſoul. As the eye, ſaith he, looking ſtedfaſtly at the viſive part or pupil of another eye beholds it's ſelf, even ſo the ſoul beholds and underſtands her ſelf, while ſhe contemplates the deity which is wiſdom and vertue or like thereunto. In the Phædon Socrates ſpeaks of God as being τ' αγαθὸν and το δέον (*a*), the good and the decent: Plotinus repreſents God as order: Ariſtotle as law.

335. It may ſeem perhaps to thoſe, who have been taught to diſcourſe about ſubſtratums, more reaſonable and pious to attribute to the Deity a more ſubſtantial being, than

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(*a*) 260, 320,

the notional entities of wiſdom, order, law, vertue, or goodneſs, which being only complex ideas, framed and put together by the underſtanding, are it's own creatures, and have nothing ſubſtantial, real, or independent in them. But it muſt be conſidered, that in the Platonic ſyſtem, order, vertue, law, goodneſs, and wiſdom are not creatures of the ſoul of man, but innate and originally exiſtent therein, not as an accident in a ſubſtance, but as light to enlighten, and as a guide to govern. In Plato's ſtyle, the term idea doth not merely ſignify an inert inactive object of the underſtanding, but is uſed as ſynonymous with ἀιτιον and ἀρχὴ, cauſe and principle. According to that philoſopher, goodneſs, beauty, vertue and ſuch like are not figments of the mind, nor mere mixed modes, nor yet abſtract ideas in the modern ſenſe, but the moſt real beings, intellectual and unchangeable; and therefore more real than the fleeting tranſient objects of ſenſe (*b*), which wanting ſtability cannot be ſubjects of ſcience (*c*), much leſs of intellectual knowledge.

336. By

(*b*) 306. (*c*) 264, 266, 297.

336. By Parmenides, Timæus, and Plato a diſtinction was made, as hath been obſerved already, between genitum and ens. The former ſort is always a generating or in fieri (e), but never exiſts, becauſe it never continues the ſame, being in a conſtant change, ever periſhing and producing. By entia they underſtand things remote from ſenſe, inviſible and intellectual, which never changing are ſtill the ſame, and may therefore be ſaid truly to exiſt. ὀυσία which is generally tranſlated ſubſtance, but more properly eſſence, was not thought to belong to things ſenſible and corporeal, which have no ſtability; but rather to thoſe ideas though diſcerned with more difficulty, and making leſs impreſſion on a mind ſtupified and immerſed in animal life, than groſs objects that continually beſet and ſollicit our ſenſes.

337. The moſt refined humane intellect exerted to it's utmoſt reach can only ſeize ſome imperfect glympſes (f) of the divine ideas, abſtracted from all things corporeal, ſenſible, and imaginable. Therefore Pythagoras and Plato treated them in a myſterious manner, concealing rather than expoſing them to vulgar

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(e) 304, 306. (f) 313, 330.

eyes; ſo far were they from thinking, that thoſe abſtract things, although the moſt real, were the fitteſt to influence common minds, or become principles of knowledge, not to ſay duty and virtue, to the generality of mankind.

338. Aristotle and his followers have made a monſtrous repreſentation of the Platonic ideas; and ſome of Plato's own ſchool have ſaid very odd things concerning them. But if that philoſopher himſelf was not read only, but ſtudied alſo with care, and made his own interpreter, I believe the prejudice that now lies againſt him would ſoon wear off (*g*), or be even converted into a high eſteem for thoſe exalted notions and fine hints, that ſparkle and ſhine throughout his writings; which ſeem to contain not only the moſt valuable learning of Athens and Greece, but alſo a treaſure of the moſt remote traditions and early ſcience of the Eaſt.

339. In the Timæus of Plato mention is made of ancient perſons, authors of traditions, and the offspring of the Gods. It is very remarkable, that in the account of the creation contained in the ſame piece, it is ſaid that

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(*g*) 309, 313.

that God was pleaſed with his work, and that the Night is placed before tbe day. The more we think, the more difficult ſhall we find it to conceive, how mere man, grown up in the vulgar habits of life, and weighed down by ſenſuality, ſhould ever be able to arrive at ſcience, without ſome tradition (*h*) or teaching, which might either ſow the ſeeds of knowledge, or call forth and excite thoſe latent ſeeds that were originally ſown in the ſoul.

340. HUMANE ſouls in this low ſituation, bordering on mere animal life, bear the weight and ſee through the dusk of a groſs atmoſphere, gathered from wrong judgments daily paſſed, falſe opinions daily learned, and early habits of an older date than either judgment or opinion. Through ſuch a medium the ſharpeſt eye cannot ſee clearly (*k*). And if by ſome extraordinary effort the mind ſhould ſurmount this dusky region, and ſnatch a glympſe of pure light, ſhe is ſoon drawn backward and depreſſed by the heavineſs of the animal nature, to which ſhe is chained. And if again ſhe chanceth, amidſt the agitation of wild fancies and ſtrong affections, to

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(*h*) 298, 301, 302. (*k*) 292, 293, 294.

ſpring upwards, a ſecond relapſe ſpeedily ſucceeds into this region of darkneſs and dreams.

341. Nevertheless, as the mind gathers ſtrength by repeated acts, we ſhould not deſpond, but continue to exert the prime and flower of our faculties, ſtill recovering, and reaching on, and ſtruggling into the upper region, whereby our natural weakneſs and blindneſs may be in ſome degree remedied, and a taſte attained of Truth and Intellectual Life. Beſide the conſtant prevailing opinion of the greateſt men of antiquity, that there is both an univerſal ſpirit author of life and motion, and an univerſal mind enlightening and ordering all things, it was a received tenet among them, that there is alſo τὸ ἓν or τ' αγαθὸν (a), which they looked on as the fons deitatis, the firſt hypoſtaſis in the divinity.

342. The one or τὸ ἓν, being immutable and indiviſible, always the ſame and entire, was therefore thought to exiſt truly and originally, and other things only ſo far as they are one and the ſame, by participation of τὸ ἓν. This gives unity, ſtability, reality to

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(a) 322.

things (b). Plato deſcribes God, as Moſes, from his being. According to both, God is he who truly is, ὁ ὄντως ὤν. Change and diviſion were eſteemed defects or bad. Evil ſcatters, divides, deſtroys. Good, on the contrary, produceth concord and union, aſſembles, combines, perfects, and preſerves entire. The ſeveral beings which compoſe the univerſe are parts of the ſame ſyſtem, they combine to carry on one end, and perfect one whole. And this aptneſs and concurrence thereunto furniſhes the partial particular idea of Good in the diſtinct creatures. Hence it might have come to paſs, that τ' ἀγαθὸν and τὸ ἓν were regarded as one and the ſame.

343. Light and ſight (ſaith Plato in the ſixth book of his Republic) are not the Sun: even ſo truth and knowledge are not the Good it ſelf, although they approach thereunto. And again, what the Sun is in a viſible place with reſpect to ſight and things ſeen, that ſame is τ' ἀγαθὸν or Good in an intelligible place, with reſpect to underſtanding and things underſtood. Therefore the good or one is not the light that enlightens, but the ſource of that light.

(b) 264, 306.

344. Every moment produceth ſome change in the parts of this viſible creation. Something is added or diminiſhed, or altered in eſſence, quantity, quality, or habitude. Wherefore all generated beings were ſaid by the ancients to be in a perpetual flux (*c*). And that which, on a confuſed and general view, ſeems one ſingle conſtant being, ſhall upon a nearer inſpection appear a continued ſeries of different beings. But God remains for ever one and the ſame. Therefore God alone exiſts. This was the doctrine of Heraclitus, Plato, and other ancients.

345. It is the opinion of Plato and his followers, that in the ſoul of man, prior and ſuperior to intellect, there is ſomewhat of an higher nature, by virtue of which we are one; and that by means of our one or unite, we are moſt cloſely joined to the Deity. And, as by our intellect we touch the divine intellect, even ſo by our τὸ ἓν or unite the very flower of our eſſence, as Proclus expreſſeth it, we touch the firſt one.

346. Ac-

(*c*) 304, 336.

346. According to the Platonic philoſophy, ens and unum are the ſame. And conſequently our minds participate ſo far of exiſtence as they do of unity. But it ſhould ſeem that perſonality is the indiviſible center of the ſoul or mind, which is a monad ſo far forth as ſhe is a perſon. Therefore Perſon is really that which exiſts, inaſmuch as it participates the divine unity. In man the monad or indiviſible is the ἄυτο το αὐτὸ the ſelf ſame ſelf or very ſelf, a thing, in the opinion of Socrates, much and narrowly to be inquired into and diſcuſſed, to the end that, knowing our ſelves, we may know what belongs to us and our happineſs.

347. Upon mature reflexion the mind, of all created beings, ſeemeth alone indiviſible, and to partake moſt of unity. But ſenſible things are rather conſidered as one than truly ſo, they being in a perpetual flux or ſucceſſion, ever differing and various. Nevertheleſs all things together may be conſidered as one univerſe (*d*), one by the connexion, relation, and order of it's parts, which is the work of mind, whoſe unite is by Platonics, ſuppoſed a participation of the firſt τὸ ἕν.

348. So-

(*d*) 287, 288.

348. Socrates, in the Theætetus of Plato, ſpeaketh of two parties of philoſphers, the ῥέοντες and ὅι τοῦ ὅλου ϛασιῶται, the flowing philoſophers who held all things to be in a perpetual flux, always a generating and never exiſting; and thoſe others who maintained the univerſe to be fixed and immoveable. The difference ſeems to have been this, that Heraclitus, Protagoras, Empedocles, and in general thoſe of the former ſect, conſidered things ſenſible and natural; whereas Parmenides and his party conſidered τὸ πᾶν, not as the ſenſible but as the intelligible world (*e*), abſtracted from all ſenſible things.

349. In effect if we mean by things the ſenſible objects; theſe, it is evident, are always flowing; but if we mean things purely intelligible, then we may ſay on the other hand, with equal truth, that they are immoveable and unchangeable. So that thoſe, who thought the whole or τὸ πᾶν to be ἓν ἕϛως a fixed or permanent one, ſeem to have underſtood the whole of real beings, which in their ſenſe was only the intellectual world, not allowing reality of being to things not permanent.

(*e*) 293, 294, 295.

350. THE diſpleaſure of ſome readers may perhaps be incurred, by ſurpriſing them into certain reflexions and inquiries for which they have no curioſity. But perhaps ſome others may be pleaſed, to find a dry ſubject varied by digreſſions, traced through remote inferences, and carried into ancient times, whoſe hoary maxims (*f*) ſcattered in this eſſay are not propoſed as principles, but barely as hints to awaken and exerciſe the inquiſitive reader, on points not beneath the atttention of the ableſt men. Thoſe great men, Pythagoras, Plato, and Ariſtotle the moſt conſummate in politics, who founded ſtates, or inſtructed princes, or wrote moſt accurately on public government, were at the ſame time moſt acute at all abſtracted and ſublime Speculations; the cleareſt light being ever neceſſary to guide the moſt important actions. And whatever the world thinks, he who hath not much meditated upon God, the Humane mind, and the Summum bonum, may poſſibly make an able earthworm, but will moſt indubitably make a ſorry patriot and a ſorry ſtateſman.

351. Ac-

(*f*) 298, 301.

351. ACCORDING to the nice metaphyſics of thoſe ancient philoſophers τὸ ἓν, being conſidered as what was firſt and ſimpleſt in the deity, was preſcinded even from entity to which it was thought prior and ſuperior; and is therefore by the Platonics ſtyled ſuper-eſſential. And in the Parmenides it is ſaid, τὸ ἓν doth not exiſt; which might ſeem to imply a negation of the divine being. The truth is, Zeno and Parmenides argued, that a thing exiſting in time was older and younger than it ſelf; therefore the conſtant immutable τὸ ἓν did not exiſt in time; and if not in time, then in none of the differences of time paſt, preſent, or to come; therefore we cannot ſay that it was, is, or will be. But nevertheleſs it is admitted in the ſame Parmenides, that τὸ νῦν is every where preſent to τὸ ἓν; that is, inſtead of a temporary ſucceſſion of moments, there is one eternal now, or, punctum Stans, as it is termed by the Schoolmen.

352. THE ſimplicity of τὸ ἓν (the father in the Pythagoric and Platonic trinity) is conceived ſuch as to exclude intellect or mind,

to which it is ſuppoſed prior. And that hath created a ſuſpicion of atheiſm in this opinion. For, ſaith the learned Doctor Cudworth, ſhall we ſay that the firſt hypoſtaſis or perſon is ἄνους and ἄλογος, ſenſeleſs and irrational, and altogether devoid of mind and underſtanding? or would not this be to introduce a kind of myſterious atheiſm? To which it may be anſwered, that whoever acknowledgeth the univerſe to be made and governed by an eternal mind, cannot be juſtly deemed an atheiſt (*g*). And this was the tenet of thoſe ancient philoſophers. In the Platonic doctrine, the generation of the νοῦς or λόγος was not contingent but neceſſary, not temporary, but from everlaſting. There never was a time ſuppoſed wherein τὸ ἓν ſubſiſted without intellect, the priority having been underſtood only as a priority of order or conception, but not a priority of age. Therefore, the maintaining a diſtinction of priority between τὸ ἓν and νοῦς doth not infer, that the one ever exiſted without the other. It follows, therefore, that the father or τὸ ἓν may, in a certain ſenſe, be ſaid to be ἄνους without atheiſm, or without deſtroying the notion of a deity; any more than it

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(*g*) 154, 276, 279, 287.

would deſtroy the notion of a humane ſoul, if we ſhould conceive a diſtinction between ſelf and intellect, or intellect and life. To which we may farther add, that it is a doctrine of Platonics, and agrees with their maſter's tenets, to ſay that τὸ ἓν or the firſt hypoſtaſis contains all excellence and perfection whereof it is the original Source, and is eminenter, as the Schools ſpeak, intellect and life, as well as goodneſs; while the ſecond hypoſtaſis is eſſentially intellect, and by participation goodneſs and life; and the third, life eſſentially, and by participation goodneſs and intellect.

353. Therefore, the whole being conſidered, it will not ſeem juſt, to fix the imputation of atheiſm upon thoſe philoſophers, who held the doctrine of τὸ ἓν; whether it be taken in an abſtracted or collective, a metaphyſical or merely vulgar, meaning (*b*); that is, whether we preſcind unity from eſſence and intellect, ſince metaphyſical diſtinctions of the divine attributes do not in reality divide them; or whether we conſider the univerſal ſyſtem of beings as one, ſince the union, connexion, and order of it's members, do

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(*b*) 300.

do manifeſtly infer a mind or intellect to be cauſe thereof.

354. τὸ ἓν may be conceived either by compoſition or diviſion. For as, on the one hand, we may ſay the world or univerſe is ONE whole or ONE animal; ſo we may, on the other hand, conſider τὸ ἓν by diviſion or abſtraction, as ſomewhat in the order of things prior to mind. In either ſenſe there is no atheiſm, ſo long as mind is admitted to preſide and direct the animal; and ſo long as the unum or τὸ ἓν is ſuppoſed not to exiſt without mind, (*a*). So that neither Heraclitus nor Parmenides, nor Pythagoras nor Plato, neither the Ægyptians nor Stoics, with their doctrine of a divine whole or animal, nor Xenophanes with his ἓν καὶ πᾶν, are juſtly to be accounted atheiſts. Therefore modern atheiſm, be it of Hobbes, Spinoſa, Collins, or whom you will, is not to be countenanced by the learning and great names of antiquity.

(*a*) 287, 288.

355. **Plato** teacheth, that the doctrine concerning the one or unite is a means, to lead and raiſe the mind (*b*) to the knowledge of him who truly is. And it is a tenet both of Ariſtotle and Plato, that identity is a certain unity. The Pythagoreans alſo, as well as the Platonic philoſophers, held unum and ens to be the ſame. Conſiſtently with which that only can be ſaid to exiſt, which is one and the ſame. In things ſenſible and imaginable, as ſuch, there ſeems to be no unity, nothing that may be called one prior to all act of the mind; ſince they being in themſelves aggregates, conſiſting of parts or compounded of elements, are in effect many. Accordingly, it is remarked by Themiſtius, the learned interpreter of Ariſtotle, that to collect many notions into one, and to conſider them as one, is the work of intellect, and not of ſenſe or fancy.

356. **Aristotle** himſelf, in his third book of the Soul, ſaith it is the mind that maketh each thing to be one, τὸ δὲ ἓν ποιοῦν τοῦτο ὁ νοῦς ἕκαστον. How this is done, Themiſtius is more particular, obſerving, that as being conferreth

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(*b*) 294, 295.

conferreth eſſence, the mind by virtue of her ſimplicity conferreth ſimplicity upon compounded beings. And, indeed, it ſeemeth that the mind, ſo far forth as perſon, is individual (*c*) therein reſembling the divine one by participation, and imparting to other things what it ſelf participates from above. This is agreeable to the doctrine of the ancients, however the contrary opinion of ſuppoſing number to be an original primary quality in things, independent of the mind, may obtain among the moderns.

357. THE Peripatetics taught, that in all diviſible things there was ſomewhat indiviſible, and in all compounded things ſomewhat ſimple. This they derived from an act of the mind. And neither this ſimple indiviſible unite, nor any ſum of repeated unites, conſequently no number, can be ſeparated from the things themſelves and from the operation of the mind. Themiſtius goeth ſo far as to affirm, that it cannot be ſeparated from the words or ſigns; and, as it cannot be uttered without them, ſo ſaith he, neither can it be conceived without them. Thus much upon the

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(*c*) 345, 346, 347.

the whole may be concluded, that diſtinct from the mind and her operations, there is in created beings neither unite nor number.

358. Of inferior beings the humane mind, ſelf, or perſon is the moſt ſimple and undivided eſſence (*d*). And the ſupreme father is the moſt perfect one. Therefore the flight of the mind towards God is called by the Platonics φυγὴ μὸνȣ πρὸς μόνον. The ſupreme being, ſaith Plotinus, as he excludes all diverſity, is ever alike preſent. And we are then preſent to him, when, recollected and abſtracted from the world and ſenſible objects, we are moſt free and diſengaged (*e*) from all variety. He adds, that in the intuition of the ſupreme deity the ſoul finds her wiſhed for end and repoſe; which that philoſopher calls awaking out of his body into himſelf.

359. In the tenth book of the arcane, or divine wiſdom of the Ægyptians, we are taught that the ſupreme being is not the cauſe of any created thing; but that he produced or made the word; and that all created beings were made by the word, which is accordingly ſtyled the cauſe of all cauſes: and that this was alſo the doctrine of the Chaldæans.

(*d*). 347. (*e*) 268.

ans. Plato, likewiſe, in his letter to Hermias, Eraſtus, and Coriſcus, ſpeaks of God the ruler and cauſe of all things as having a father: And, in his Epinomis, he expreſly teacheth that the word or λόγος made the world. Accordingly Saint Auguſtine in his commentary on the beginning of Saint John's Goſpel, having declared that Chriſt is the wiſdom of God by which all things were made, obſerves that this doctrine was alſo found in the writings of philoſophers, who taught that God had an only begotten Son by whom are all things.

360. Now, though Plato had joined with an imagination the moſt ſplendid and magnificent, an intellect not leſs deep and clear; yet it is not to be ſuppoſed, that either he or any other philoſophers of Greece or the Eaſt, had by the light of nature attained an adequate notion of the Holy Trinity, nor even that their imperfect notion, ſo far as it went, was exactly juſt; nor perhaps that thoſe ſublime hints, which dart forth like flaſhes of light in the midſt of a profound darkneſs, were originally ſtruck from the hard rock of humane reaſon; but rather derived, at leaſt

in part, by a divine tradition (*f*) from the author of all things. It ſeems a remarkable confirmation of this, what Plotinus obſerves in his fifth ennead, that this doctrine of a Trinity, father, mind, and ſoul, was no late invention, but an ancient tenet.

361. Certain it is, that the notion of a Trinity is to be found in the writings of many old heathen philoſophers, that is to ſay, a notion of three divine hypoſtaſes. Authority, light, and life did, to the eye of Reaſon, plainly appear to ſupport, pervade, and animate the mundane ſyſtem or macrocoſm. The ſame appeared in the microcoſm, preſerving ſoul and body, enlightening the mind, and moving the affections. And theſe were conceived to be neceſſary univerſal principles, coexiſting, and cooperating in ſuch ſort, as never to exiſt aſunder, but on the contrary to conſtitute one Sovereign of all things. And, indeed, how could power or authority avail or ſubſiſt without knowledge? or either without life and action?

(*f*) 298, 301.

362. In the adminiſtration of all things there is authority to eſtabliſh, law to direct, and juſtice to execute. There is firſt the Source of all perfection, or fons deitatis, ſecondly the ſupreme Reaſon, order, or λογος, and laſtly the Spirit which quickens and inſpires. We are ſprung from the father, irradiated or enlightened by the ſon, and moved by the ſpirit. Certainly, that there is father, ſon, and ſpirit; that theſe bear analogy to the ſun, light, and heat; and are otherwiſe expreſſed by the terms principle, mind, and ſoul; by one or τὸ ἓν, intellect, and life; by good, word, and love; and that generation was not attributed to the ſecond hypoſtaſis, the νοῦς or λόγος, in reſpect of time, (g), but only in reſpect of origine and order, as an eternal neceſſary emanation; theſe are the expreſs tenets of Platoniſts, Pythagoreans, Ægyptians, and Chaldæans.

363. Though it may be well preſumed there is nothing to be found on that ſublime ſubject in humane writings, which doth not bear the ſure Signatures of humanity; yet it

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(g) 352.

cannot be denied, that ſeveral fathers of the church have thought fit to illuſtrate the chriſtian doctrine of the holy trinity, by ſimilitudes and expreſſions borrowed from the moſt eminent Heathens, whom they conceived to have been no ſtrangers to that myſtery; as hath been plainly proved by Beſſarion, Eugubinus, and Doctor Cudworth.

364. Therefore, how unphiloſophical ſoever that doctrine may ſeem to many of the preſent age, yet it is certain, the men of greateſt fame and learning among the ancient philoſophers held a trinity in the Godhead. It muſt be owned, that upon this point ſome later Platoniſts of the Gentile world ſeem to have bewilder'd themſelves, (as many Chriſtians have alſo done) while they purſued the hints derived from their predeceſſors, with too much curioſity.

365. But Plato himſelf conſidered that doctrine as a venerable myſtery, not to be lightly treated of or raſhly divulged. Wherefore in a letter to Dionyſius he writes (as he himſelf profeſſeth) ænigmatically and briefly in the following terms, which he giveth for a ſummary of his notion concerning the ſu-

preme Being, and which being capable of divers ſenſes, I leave to be decyphered by the learned reader. περὶ τὸν πάντων βασιλέα πάντ' ἐςὶ. καὶ ἐκείνου ἕνεκα πάντα. καὶ ἐκεῖνο ἄιτιον ἁπάντων τῶν καλῶν, δεύτερον δὲ περὶ τὰ δεύτερα, καὶ τρίτον περὶ τὰ τρίτα. Plato enjoins Dionyſius over and over, with great earneſtneſs not to ſuffer, what he communicates concerning the myſtery of the divine Nature, to fall into illiterate or vulgar hands, giving it withal as a reaſon for this caution, that nothing would ſeem more ridiculous or abſurd to the common run of mankind. He adds, that in regard writings might miſcarry, the prudent way was to write nothing at all on thoſe matters, but to teach and learn them by word of mouth: for which reaſon, ſaith he, I have never wrote any thing thereon; nor is there, nor ſhall there ever be any thing of Plato's, extant on that ſubject. He farther adds, as for what hath been now ſaid, it belongs all to Socrates.

366. And, indeed, what this philoſopher in his Phædrus ſpeaketh of the supercœleſtial region, and the divinity reſident therein, is of a ſtrain not to be reliſhed or comprehended by vulgar minds; to wit, eſſence really exiſtent, object of intellect alone, without colour, without figure, without any tangible

quality. He might very juſtly conceive that ſuch a deſcription muſt ſeem ridiculous to ſenſual men.

367. As for the perfect intuition of divine things, that he ſuppoſeth to be the lot of pure ſouls, beholding by a pure light, initiated, happy, free and unſtained from thoſe bodies, wherein we are now impriſoned like oyſters. But in this mortal ſtate, we muſt be ſatisfy'd to make the beſt of thoſe glympſes (*b*) within our reach. It is Plato's remark in his Theætetus, that while we ſit ſtill we are never the wiſer, but going into the river and moving up and down, is the way to diſcover it's depths and ſhallows. If we exerciſe and beſtir our ſelves, we may even here diſcover ſomething.

368. The eye by long uſe comes to ſee even in the darkeſt cavern: and there is no ſubject ſo obſcure, but we may diſcern ſome glympſe of truth by long poring on it. Truth is the cry of all but the game of a few. Certainly where it is the chief paſſion, it doth not give way to vulgar cares and views; nor is it contented with a little ardour in the early time of life, active, perhaps, to purſue, but

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(*b*) 335, 337.

but not ſo fit to weigh and reviſe. He that would make a real progreſs in knowledge, muſt dedicate his age as well as youth, the later growth as well as firſt fruits, at the altar of Truth.

Cujuſvis eſt errare, nullius niſi inſipientis in errore perſeverare. Cic.

FINIS.

21 JY 64

Corrigenda et Addenda.

Page.	Line.	
13.	6.	*Read,* that pitch.
16.	1.	*after* parts, *inſert* Tar in ſubſtance mix'd with honey I have found an excellent medicine for coughs.
45.	14.	*r.* mineral waters.
54.	26.	*after* whatſoever, *add,* certainly I have found this ſucceed at a glaſs every half hour.
63.	23.	*r.* Monſieur Poupart.
80.	4.	*after* that *inſert* being rubbed on them.
81	2.	*after* nutmegs, *inſert,* or a ſpoonful of mountain wine.
———	6.	*after* inconvenience, *add,* and that with ſome it agrees beſt warm, with others cold.
148.	18.	*r.* in the agent.
169.	27.	*r.* burnt limeſtone.
182.	6.	*r.* although inviſible.
183.	23.	*r.* ſecondary.
208.	17.	*after* incorporeal, *inſert* unextended.
223.	23.	*dele* commonly.
239.	15.	*r.* to intellectual ideas.
245.	16.	*r.* the perſon or mind.
251.	3.	*r.* The one or τὸ ἓν.
259.	4.	*r.* αἴτιον.